

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

SOUTH WILLIE TIMBER SALE

Environmental Assessment Number: OR080-2001-02  
Tract # 2004-305

November 24, 2003

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
SALEM DISTRICT OFFICE  
MARYS PEAK RESOURCE AREA  
Benton County, Oregon

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**Abstract:** The Bureau of Land Management proposes a timber sale project to commercially thin approximately 157 acres of Matrix land and reduce stand densities and encourage the development of older forest characteristics in approximately 42 acres of riparian reserve. The action would occur on federal land in Sections 6 and 7, T. 15 S., R. 6 W., and Section 12, T. 15 S., R 7 W., Willamette Meridian, Benton County, within the Upper Alsea River fifth-field watershed, Willamette Province.

This environmental assessment discloses the predicted environmental effects of two alternatives: Alternative A (Proposed Action) and Alternative B (No Action). The Proposed Action involves three projects. Project 1 would include a timber sale, enhancement of riparian reserves, and road construction, reconstruction and improvement. Project 2 would include girdling trees for snag creation and felling trees to meet coarse woody debris objectives in the Riparian Reserves. Project 3 would entail hand-falling individual trees into a perennial stream to enhance stream habitat.

# FINDING OF NO SIGNIFICANT IMPACT

## INTRODUCTION

The Bureau of Land Management (BLM) has conducted an environmental analysis (EA, Environmental Assessment Number OR080-2001-02) for a proposal to commercially thin and density manage approximately 200 acres of timber in Matrix and Riparian Reserve land use allocations, to girdle/fall trees for snag creation and coarse woody debris within Riparian Reserves, and to fell approximately 4 trees/1000 feet of stream into a perennial tributary to enhance aquatic habitat. The project area is within sections 6 and 7, T.15 S., R. 6 W. and section 12, T. 15 S., R. 7 W., Willamette Meridian, Benton County, in the Upper Alsea watershed, Willamette Province. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

Implementation of the proposed action will conform to management actions and direction contained in the *Salem District Record of Decision and Resource Management Plan (RMP)*; *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late Successional and Old Growth Related Species Within the Range of the Northern Spotted Owl* (April 1994); *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (ROD, January, 2001)*; and the *Implementation of 2002 Survey and Manage Annual Species Review* (June 2003).

The EA and FONSI will be made available for public review from December 1, 2003 to January 9, 2004. The public notice of availability for review will be published in a legal notice by local newspapers of general circulation and through notification of individuals, organizations, and state and federal agencies with affected interests. The documents will also be available for review on the internet at <http://www.or.blm.gov/salem/html/planning/index.htm>, under Environmental Assessments. Comments received by the Marys Peak Resource Area of the Salem District Office, 1717 Fabry Rd SE, Salem, OR, 97306, via email: [ashley\\_laforge@blm.gov](mailto:ashley_laforge@blm.gov), on or before January 9, 2004 will be considered in making the final decisions for this project.

## FINDING OF NO SIGNIFICANT IMPACT DETERMINATION

Based upon review of the EA and supporting documents, I have determined that the Proposed Action (Alternative A) is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Therefore, an environmental impact statement is not needed. This finding is based on the following discussion:

1. Potential effects resulting from the implementation of the proposed action have been analyzed within the context of the Upper Alsea River 5<sup>th</sup>-field Watershed and the project area boundaries. The proposed action would occur on approximately 200 acres of BLM Matrix land, encompassing less than 2% of the Upper Alsea River Watershed [40 CFR 1508.27(a)].

2. With the implementation of project design features including but not limited to:
  - a. retaining all coarse woody debris and snags, where possible, for wildlife habitat,
  - b. implementing a daily operational time restriction to avoid noise disturbances to wildlife,
  - c. seasonally restricting ground-based yarding and road construction operations to avoid runoff and sedimentation,
  - d. operating equipment on top of slash and logging debris to minimize compaction,
  - e. installing erosion control measures as needed [water bars, sediment traps in ditchlines, silt fences, straw bales, and grass seeding exposed mineral soil areas],
  - f. establishing no-treatment zones adjacent to all project area streams to maintain canopy cover, water quality, and channel morphology,
  - g. gating roads after project completion to minimize a fire hazard from vehicles,

the proposed action is unlikely to have any significant impacts on vegetation/botany, soils, air quality/fuels, water, fish, riparian reserves, or wildlife resources. Any potential effects to these resources are anticipated to be site-specific and/or immeasurable (ie. undetectable over the watershed, downstream, and/or outside of the project area) [40 CFR 1508.27(b)(1), EA Chapter II p. 8-13, Chapter III, p.14-33].

3. The proposed action would not affect:

- a. Public health or safety [40 CFR 1508.27(b)(2)] (EA Appendix 1);
- b. Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] because there are no historic or cultural resources, parklands, prime farmlands, wild and scenic rivers, wilderness, or ecologically critical areas located within the project area;
- c. Districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed action cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA Appendix 1).


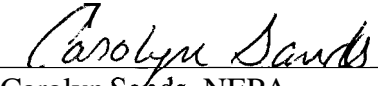

4. The proposed action is not unique or unusual. The BLM has experience implementing similar actions in similar areas without highly controversial [40 CFR 1508.27(b)(4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b)(5)].
5. The proposed action does not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration [40 CFR 1508.27(b)(6)].
6. The interdisciplinary team evaluated the proposed action in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b)(7)]. Potential cumulative effects to the Upper Alsea River Watershed include: enhancement of late-successional forest characteristics (upland and within riparian reserves), decreased mistletoe infection, increased soil compaction and disturbance, an increase in the accumulation of fine and medium sized fuels, increased fish habitat and stream channel complexity, and maintenance of early and mid-seral wildlife habitat.

However, these effects are not likely to be significant because of the project's scope (effects are likely to be too small to be measurable), scale (project area of 200 acres, less than 2% of the total 5th-field watershed), and duration (direct effects would occur over a maximum period of 2-3 years).

7. The proposed action would not adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b)(9)]. There is no northern spotted owl or marbled murrelet critical habitat in or near the project area. Consultation with the USFWS resulted in a "*May Affect, Not Likely to Adversely Affect*" determination for northern spotted owl, due to a possible impact to owl behavior as a result of thinning owl dispersal habitat, and a "*May Affect, Likely to Adversely Affect*" determination for marbled murrelet for noise disturbance during the breeding season. This disturbance would be mitigated by restricting operational periods, thereby eliminating any noise disturbance to marbled murrelet during the nesting period (EA p. 10). The proposed action will follow all applicable terms and conditions from the Biological Opinion dated February 27, 2003 [BO# 1-7-03-00081].

This project has been determined "not likely to adversely affect" the Oregon Coast coho salmon (*Oncorhynchus kisutch*) (EA p. 37, Appendix 1). The Letter of Concurrence (LOC) was received by the BLM on August 21, 2003 from NOAA Fisheries.

8. The proposed action does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b)(10)] (EA p.8, Appendix 1).

Prepared by:	 Ashley La Forge, Project Lead	<u>11/26/03</u> Date
Reviewed by:	 Carolyn Sands, NEPA	<u>11/26/03</u> Date
Approved by:	 Cindy Enstrom, Field Manager Marys Peak Resource Area	<u>11/26/03</u> Date

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# ENVIRONMENTAL ASSESSMENT

## CHAPTER I – Project Scope

### *Project Location*

The proposed management activities would be located in Sections 6 and 7, T.15 S., R. 6 W., and Section 12, T. 15 S., R. 7 W., W.M., Benton County, within the Upper Alsea River fifth field watershed (see General Vicinity Map in Chapter VII, of this EA). The project area is approximately ten miles southwest of the town of Monroe, Oregon. The actions would occur on lands classified as Matrix and Riparian Reserves in the RMP (RMP pgs. 10 & 20).

### *Purpose and Need*

#### **Project 1 (Commercial thinning and density management)**

The action described and analyzed herein is proposed for the purposes of meeting the need for forest products and forest habitat as described in the *Salem District Resource Management Plan* (RMP, 1995, pp. 1 and 2). There is a need to:

- supply timber and other forest products that would help maintain the stability of local and regional economies;
- provide for retention of important ecological components within the forest management area;
- concentrate the sites' productivity on fewer stems, resulting in a higher quality end product, healthier forest, and removal of trees which would otherwise die before final harvest;
- reduce the spread of dwarf mistletoe to uninfected stands;
- accomplish road restoration and riparian enhancement in a manner that meets the Aquatic Conservation Strategy Objectives outlined in the RMP (pgs. 5-6).

Approximately 42 acres of the proposed project is classified as Riparian Reserves as described on page 9 of the RMP. The BLM land within the Upper Alsea River watershed was analyzed in the *South Fork Alsea Watershed Analysis*, (SFAWA, November, 1995). The SFAWA (p. 79 and Map 15) recommends density management after site specific analysis on stands exhibiting characteristics similar to those in the proposed project area (p.5-6 and Table 1, p.7). The watershed lacks adequate large woody debris potential for streams (SFAWA, p.65) and lacks snags, down wood, sub-canopy layers and species diversity (SFAWA, p. 40).

The goal of this project in the Riparian Reserves would be to maintain forest health and to begin the development of older forest characteristics. The proposed project would accelerate diameter growth, maintain crown ratios, begin a second canopy layer and maintain species diversity. Understory conifers would be planted if there is appropriately large openings, which would eventually become a second canopy layer.

## **Project 2 (Snag creation and coarse woody debris enhancement)**

The purpose of this project is to increase the volume of snags and large diameter coarse woody debris (CWD) in the riparian reserves for wildlife and ecosystem complexity.

## **Project 3 (Fish habitat enhancement)**

The purpose of this project is to promote complex and diverse habitat types for fish in the tributary stream north of unit 6A (Chapter VII, Project Map). The majority of current large woody debris in this stream is older wood. There is a need to add a supply of new, larger wood that would allow habitat types to increase in complexity for resident fish and other aquatic species.

## ***Conformance with Land Use Plans, Policies and Programs***

The proposed action is in conformance with the *Salem District Record of Decision and Resource Management Plan (RMP, May 1995)* and tiers to the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement (FEIS, September 1994)*.

The proposed action is also in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (April 1994), the *Record of Decision and Standards and Guidelines for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (S&M ROD, January 2001)*, the *Results of the 2001 and 2002 Survey and Manage Annual Species Review* (Refer to the 2001 Standard and Guidelines, pp. 18-19, BLM Information Bulletins No. OR-2002-064, OR2002-033 and OR2003-050), the *Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement (VMFEIS, February 1989)*, the *Western Oregon Program-Management of Competing Vegetation Record of Decision* (August 1992, pgs. 3 & 33), the *Northwest Area Noxious Weed Control Program Final EIS* (USDI, 1985) and the associated *Record of Decision* (USDI, April 7, 1986), the *Supplement to the Northwest Area Noxious Weed Control Program* (USDI, March 1987) and its associated *Record of Decision* (May 5, 1987), and the *South Fork Alsea Watershed Analysis* (October 1995).

The above cited documents are available for review in the Salem District Office. Additional information about the proposed South Willie project is available in the South Willie Timber Sale NEPA/EA Analysis File (SWAF), also available at the Salem District Office.

## ***Decision to Be Made***

The Marys Peak Field Manager is the official responsible for deciding whether or not to prepare an environmental impact statement, and whether to approve these projects as proposed, not at all, or to some other extent.



## **CHAPTER II - ALTERNATIVES, INCLUDING THE PROPOSED ACTION**

This EA will analyze the effects of the “proposed action” and “no action” alternatives. No unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified. No alternatives were identified that would meet the purpose and need of the project and have meaningful differences in environmental effects from the proposed action.

### ***Alternative A: The Proposed Action***

#### **Project 1 (Commercial Thinning and Density Management)**

The proposed action includes commercial thinning on approximately 157 acres in Matrix (otherwise known as General Forest Management Areas [GFMA, RMP, p.20]) density management and coarse woody debris and snag creation on 42 acres in Riparian Reserves (RMP, p.11), new road construction and road renovation. Trees averaging 50 years old would be skyline yarded on approximately 133 acres and ground-based yarded on approximately 66 acres (Appendix 4). Approximately 4,745 feet of new road construction, 4,045 feet of road reconstruction, and 9,435 feet of road improvement/renovation would occur to access the harvest areas (Appendix 3). Following harvest, approximately 15,740 feet of road would be closed to public vehicular use. (Chapter VII, Project Map).

#### **Project Design Features**

Project design features are operating procedures that would be included in the design and implementation of the proposed action alternative. They also include measures proposed to mitigate adverse environmental effects. The design features of this proposal are described below. All acres and other numerical units are approximate.

#### **Timber Falling**

- The uplands would be thinned to an average of 150 square feet basal area, leaving approximately 100 green conifer trees per acre in all units, except Units 7A-1, 7D-1, 12C-1 and 12C-2 (silvicultural special mark units), where all mistletoe-infected western hemlock up to 24 inch diameter breast height (DBH) would be removed, including western hemlock seedlings and saplings over 24 inches in height (Chapter VII, Project Map). Mistletoe infected western hemlock in the silvicultural special mark units that are greater than 24 inches DBH would be girdled as part of the timber sale action in order to create snags and prevent transfer of the disease. The average leave DBH is 16 inches with approximately 20 foot spacing. All other tree species would be reserved in all units.
- Priorities for tree marking would be based on Marking Guidelines contained within the Silvicultural Prescription (Silviculture Prescription, SWAF).

- The Riparian Reserves would be thinned to a basal area range of 120 to 140 square feet and a range of 70 to 90 trees per acre. The basal area over the Riparian Reserves should average 130 square feet and 80 trees per acre, with variable spacing. Where special mark areas occur within riparian reserves, the majority of western hemlock over 24" DBH would be reserved.
- Where appropriate and especially in Riparian Reserves, additional leave trees would be marked to serve as protection around snags.
- Priorities for tree marking would be based on Riparian Reserve Marking Guidelines (Riparian Reserves Report, SWAF).
- Stream Protection Zones (SPZ) would be established along all streams and identified high water table areas within the harvest area. No cutting or yarding would take place within SPZs. Where necessary, all trees within one tree height of SPZs would be felled directionally away from streams. If trees fall into the SPZ, only that portion outside of the zone would be removed (*Criteria for Identifying Stream Protection Zones*, Riparian Reserves Report, SWAF).
- All open grown "wolf trees", existing snags and all coarse woody debris would be reserved, except within road rights-of-way (ROW), or for safety reasons.
- Reserved green trees and snags that constitute a safety hazard would be cut and left.
- Management of Survey and Manage Species found as a result of inventories would be accomplished in accordance with the *Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M ROD, January 2001) and the *Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (S&M FSEIS, November 2000) and the 2002 Annual Species Review Table 1-1 (June 2002).
- Management of all survey and manage known sites located within the proposed project area would be accomplished in accordance with management direction of the standards and guidelines S&M ROD, January 2001 (p. 8-14).
- A daily time restriction would be required on all units to minimize noise disturbance to adjacent murrelet habitat from April 1 to September 15 of each calendar year. No operations would begin until two hours after sunrise and all operations would cease two hours before sunset.
- Harvest of floral greenery, transplants, and other Special Forest Products would be permitted before and after harvest operations. If firewood is present on landings after logging completion, firewood permits would be made available to the public.

## **Yarding**

- Logs would be yarded with a skyline cable system on approximately 133 acres (67 percent of total harvest area) and a ground-based system on approximately 66 acres (33 percent of the total harvest area).
- Yarding with ground-based equipment would be restricted to periods of low soil moisture, generally between July 15 and October 31. Based on weather, soil conditions, and bark slippage the ground-based yarding season could be extended at the discretion of the Authorized Officer (Fuels/Soils Report, SWAF).
- Ground-based, track-mounted equipment may be used on slopes less than 35 percent. Small crawler yarding equipment with an integral arch and generally a 105" blade, would utilize designated skid roads spaced at least 150 feet apart. Shovel yarders and harvester/forwarders may also be utilized, with approximately 60 foot spacing between shovel, harvester, or forwarder roads. Where practical and feasible, ground-based yarding would use existing skid roads and operate on top of logging debris and slash. To avoid damage to residual tree roots, skid roads would not be ripped.
- Waterbars would be installed where they are determined to be necessary by the Authorized Officer.
- All yarding would be restricted to periods of low sap flow, generally between July 15 of one calendar year and April 15 of the next.
- In the skyline yarding area, one end suspension of logs would be required over as much of the area as possible to minimize soil compaction, damage to reserve trees, and disturbance. Yarding corridors would average 150 feet apart where they intersect boundaries and be 15 feet or less in width. Lateral yarding up to 75' from the skyline, using an energized, locking carriage would be required. If necessary, skyline yarding over streams would require full suspension.
- To facilitate skid trail and skyline corridor yarding, existing down logs would be cut at a bevel and pushed to the side in a manner that would not damage residual trees.
- To provide for adequate suspension, some trees located within the Riparian Reserves and stream protection zones (SPZ), may be topped for tail trees. Tops would be reserved and not removed from the site (Riparian Reserves Report, SWAF).
- Landing slash would be piled with a hydraulic loader, covered in late summer, and burned in the fall under favorable smoke management conditions, in accordance with the Oregon Smoke Management Plan.
- Where necessary, all exposed mineral soil on ground-based yarding areas, landings, and roads to be constructed would be seeded with Oregon Certified, Blue Tag, red fescue (*Festuca rubra*) at a rate equal to 40 pounds per acre (Botany Report, SWAF).

### **Road and Landing Construction, Road Management**

- In order to accommodate either a fixed boom yarder or to provide a safe area for landing and loading logs, some excavation and/or construction of step landings may be necessary at some landing locations. Log landings would be spaced approximately 150 to 200 feet apart.
- Approximately 4,745 feet of new road, located predominantly on or near ridgetop locations, would be constructed; approximately 4,045 feet of road would be reconstructed generally in their existing locations; and 9,435 feet of existing road would be improved/renovated. Generally where grades are less than 8 percent, roads would be outsloped without ditches, where practical. Generally grades over 8 percent would be constructed with ditches, and depending on gradient, cross drains would be installed at intervals not exceeding 400 feet.
- In order to limit surface runoff and soil erosion, road construction would generally be restricted to periods of dry weather and low soil moisture (typically May through October).
- Road construction length and width and landing construction area would be minimized as much as practical. Sediment traps would be used in ditch lines as necessary both during and immediately after construction to limit soil erosion.
- Timber hauling would be allowed on rock surfaced roads between March 1<sup>st</sup> and November 31<sup>st</sup>. On natural surfaced roads, road number 15-6-18, the P4 spur, and the P5 spur, hauling would be limited to periods of low precipitation, approximately May through October (Chapter VII, Project Map). Extended seasonal haul may be allowed upon agreement with the timber sale purchaser. Additional rocking or other measures may be required along a portion of the haul route that includes road number 14-6-34. On all roads during periods of high rainfall, the Authorized Officer may restrict log hauling to minimize water quality impacts, especially if sediment transport is imminent. Silt fences and straw bales or other sediment control devices would be installed if necessary to control sediment transport.
- Where practical, skid roads near landings would be blocked with landing debris to deter off-road vehicle use. Following harvest a gate would be installed on road No. 15-6-7.2.

### **Project 2 (Snag Creation and Coarse Woody Debris Enhancement)**

Approximately three years following project 1 completion (after exposure to windthrow and bark beetles), the size and condition of CWD and snags within Riparian Reserves would be evaluated. Based on this evaluation, snags and/or down wood would be created by girdling and hand falling of individual trees, according to the recommendations of the Wildlife Biologist (Chapter VII, Project Map and Riparian Reserves Report, SWAF).

Applicable design features for this project include: implementation of stream protection zones (inside which no activity would take place), all open grown “wolf trees” and existing snags and coarse woody debris would be reserved, and all appropriate plant and animal surveys would be completed according to protocol prior to project implementation.

### **Project 3 (Fish Habitat Enhancement)**

In the stream protection zone of the fish-bearing stream north of Unit 6A, approximately four trees per 1000 feet of stream would be cut and left in place for use as instream structures (Chapter VII, Project Map). Cut trees would be of average stand diameter or larger, at the discretion of the wildlife, botanist, and fisheries biologists.

Applicable design features include: reserving all trees stabilizing stream banks and restricting work to the instream protocol period (during low flows).

#### ***Alternative B: No Action***

Thinning, density management, road construction, road renovation, riparian reserve restoration, and stream and aquatic enhancement in sections 6, 7, and 12 would be deferred to a later date.

#### ***Alternatives Considered But Eliminated***

1. Aerial yarding was considered but eliminated for several reasons. The project area has well established stable logging and transportation systems and aerial yarding would be considerably more costly (approximately 50-75% more than conventional yarding systems). It would require increased large landing construction and potential site mitigation from using a helicopter could not justify the higher costs of using the system. Finally, special silvicultural requirements regarding western hemlock (special mark areas) and ACS objectives precluded the helicopter option due to the nature of its practical operating requirements.
2. Approximately 500 to 640 acres were initially considered for commercial thinning or density management but not recommended by the interdisciplinary team because of:
  - \* Aquatic Conservation Strategy objectives conflicts
  - \* Riparian Reserves and upland areas not needing treatment
  - \* Owl/murrelet reserves
  - \* Inoperable ground
  - \* Road construction/reconstruction avoidance

## CHAPTER III - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

In accordance with law, regulation, executive order and policy, an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter II. Those elements of the human environment that were determined to be affected define the scope of environmental concern, and include vegetation, soils, fuels, hydrology, fisheries, Riparian Reserves, and wildlife. This chapter describes the current condition and trend of those affected elements, and the environmental effects of the alternatives on those elements.

For a full discussion of the physical, biological and social resources of the Salem District, refer to the *FEIS*. The discussion in this environmental assessment is site-specific and supplements the discussion in the *FEIS*.

### *Vegetation/Botany*

#### **Vegetation/Botany: Affected Environment**

The major plant grouping of the project area is the Douglas-fir/Red Alder/Salmonberry grouping, which occurs on the west slopes of the Oregon Coastal Mountains (*FEIS*, v.1, Chapter 3, p.29-32). The most abundant plant associations in the project area are the western hemlock/salal and western hemlock/sword-fern. Elevations in the area range from 1000 to 2300 feet. The average canopy density is 75% and the average conifer diameter is approximately 14". The majority of the area is dominated by 50-year old stands of Douglas-fir, western hemlock, or a mixed canopy of both. The project area understory and shrub layers vary from open to fairly thick.

The project area contains one "unique" vegetative habitat along the southern portion of unit 12C, where just below the ridge line there is a series of 10-15 foot rocky outcrops & cliffs (Chapter VII, Project Map).

Diseases and insect infestations in the project area include: dwarf mistletoe, *Phellinus*, brown cubical butt rot, and small Douglas-fir bark beetle.

Dwarf mistletoe is common in several locales, especially along the southern boundary of the project area and in some cases involves several acres. *Phellinus*, brown cubical butt rot, and infestations of the Douglas-fir bark beetle are generally confined to fairly small locations within the project area. Tansy ragwort (*Senecio jacobaea*), bull and Canadian thistles (*Cirsium vulgare* and *C. arvense*), St. John's wort (*Hypericum perforatum*), and Scot's broom (*Cytisus scoparius*) noxious weeds are also known to occur within or adjacent to the project area.

There are no known historical sites of any special status or special attention vascular plant, lichen, bryophyte or fungi species within the project area. Following Bureau survey protocols, no additional sites of any of these species were located (Vegetation/Botany Report, SWAF).

## **Vegetation/Botany: Environmental Consequences**

### *Alternative A: Proposed Action*

#### **Project 1: Commercial Thinning and Density Management**

The proposed project would decrease the existing coniferous canopy cover, thereby increasing the density of understory species by allowing more sunlight to reach the forest floor. Many open slash covered areas would become dominated by shrub and/or fern species. Sunlight would also be increased to the lower parts of the canopy which may increase the growth rate of understory conifers. Eventually we expect that the canopy cover would increase to over 75%.

The tops, branches, and broken/shattered stems that would remain on site to decay, as well as any blow down timber could provide habitat for Douglas-fir bark beetle. In the unlikely event of a large infestation of these beetles, some reserved Douglas-fir trees may be killed in 1 to 5 years following infestation. Subsequent infestations are not likely after approximately 5 years. If standing trees are killed, they may create snags which are valuable for wildlife and any post-harvest blown-down timber may provide additional coarse woody debris.

In the special mark areas (Chapter VII, Project Map), in units 7A-1, 7D-1, & 12C-1&2, the removal of mistletoe-infected trees should decrease the amount and spread of mistletoe infection to other western hemlock trees.

During road construction/renovation, all the current vegetation located in proposed right-of-ways would be removed and any stumps grubbed out and scattered adjacent to the roadways. All areas of exposed mineral soil would be sowed with grass seed for erosion and noxious weed control (refer to Vegetation/Botany Report, SWAF, for detailed information regarding the proposed grass seeding).

#### *Cumulative Effects:*

The proposed project would help to generate larger, higher quality, more wind-firm trees, promote understory development, decrease mistletoe infestation, and increase the number of snags and coarse woody debris in the Upper Alsea River watershed.

#### **Project 2: Snag Creation and Coarse Woody Debris Enhancement**

Project 2 would only affect scattered, individual trees within the Riparian Reserves, creating localized openings in canopy cover and generating snags and coarse woody debris. Felled conifers could potentially break or fall hardwoods as they fall. The additional canopy openings would allow for greater growth within the understory or shrub layer. The broken tops of any damaged hardwoods would provide additional snags. As the conifers decay and become decay class 3, 4, and 5 they could provide a “seed bed” for western hemlock seedlings. This could provide for future conifers within the project area. Since project 2 involves only falling trees with little ground disturbances anticipated, any effects would be minor, therefore no cumulative effects to vegetation are anticipated.

### **Project 3: Fish Habitat Enhancement**

Falling conifer trees from within the riparian area and into the aquatic system would have little ground disturbing effects. The fallen trees would create small, additional openings in the existing canopy.

There are no known sites of any special status or special attention vascular plant, bryophyte, lichen, or fungal species, however the proposed project area has not yet been surveyed for these species. All appropriate surveys would be completed to protocol prior to project implementation. If any special status or special attention species are located within the project area they would be protected using appropriate Bureau Management Recommendations. Since project 3 involves only falling trees with little ground disturbances anticipated, any effects would be minor and no cumulative effects to vegetation resources are anticipated.

#### *Alternative B: No Action*

The project area would not be thinned and succession would be allowed to shape the stand (including the amount of snags and down woody debris) for the future. Because no mineral soil would be exposed from the proposed action, any existing non-native or noxious weed species would remain low. Grass seeding would not be necessary to reduce erosion and for weed abatement. Because mistletoe infection in western hemlock would continue unchecked, western hemlock trees in the northern end of the project area could become infected.

### ***Soils***

#### **Soils: Affected Environment**

The predominant soil series on and around the project sites are: Bohannon gravelly loam and Klickitat gravelly clay loam. There are also a few areas with Blachly clay loam, Marty silty clay loam and Kilchis rocky loam. Slopes on the majority of the project area vary from 30% to 70%, with a few flatter areas along ridges as well as some inclusions of steep side slopes up to approx. 100%. The steepest portions of the unit have shallow rocky soil (Kilchis).

Due to the substantial amount of clay and silt size particles in these soils, they are prone to becoming compacted when subjected to pressure from heavy equipment, dragging logs etc. The degree and depth of compaction will generally be higher when soils are subjected to pressure from logging activities when soil moisture levels are high. Once compacted, these fine textured soils are very slow to recover. Moderately compacted soils persist in a few scattered existing skid trails and old haul roads that date back to the original tractor and high lead logging that was done in portions of the site in the 1930's to 1950's. The skid trails and old haul roads are generally less than 10 feet in width, leaving the stands fully occupied by tree canopies, with brush growing in most of the trails.



## **Soils: Environmental Consequences**

### *Alternative A: Proposed Action*

#### **Project 1:**

Timber falling and yarding operations are likely to have minimal, local effects on soil resources in the project area.

Skyline yarding roads, (area affected: about 3% of the skyline area or a maximum of approximately 4-5 acres) usually result in light compaction of a narrow strip less than 4 feet in width. This is especially true for this type of project where logs are relatively small and there will be adequate slash on the ground in the corridors to yard over. Effect on site productivity from this type of disturbance is minimal to none. The percentage of the total project area impacted by surface disturbance and soil compaction as a result of skyline yarding and landings is estimated to be approximately 2 % (a maximum of 4 acres).

Ground based yarding impacts would vary depending on whether harvester / forwarder system or crawler tractors are used, how dry the soils are when heavy equipment operates on them and how deep the soils are covered with slash in the yarding roads. For many of the landings, equipment would operate on existing haul roads or harvest roads. Additional ground would simply be used to deck logs until transport. We expect a moderate amount of top soil displacement to occur in yarding roads, with higher amounts of displacement at landings. Areas where logs are decked would have minimal disturbance. Areas where equipment turns or backs around multiple times would experience heavy compaction and disturbance to the top soil layer.

If a harvester/forwarder system is used for the entire ground based area, the percentage of the total project area likely to be affected by soil disturbance and/or compaction would be approximately 1-3.1%, with very little to no loss of top soil. The effect on overall site productivity from this light to moderate compaction is expected to be low (likely less than a 1 to 2% reduction in overall yield).

If yarding is done using crawler tractors for the entire ground based area, the percentage of the project area affected by compaction would be approximately 3 to 3.6%, with an expected loss (displacement) of a small amount of top soil in yarding corridors and at landings. The effect on overall site productivity from mostly moderate compaction is expected to be a less than 1 to 2% reduction in overall yield.

The severity of compaction can be further mitigated to some extent when slash and small logs are left in the skid roads and the total number of passes is low (less than 10). With tractor skidding it is much harder to keep slash and debris on the skid roads for more than a few passes, so additional effort would be needed to replace slash and debris on skid roads. Operating only when soils are dry and soil strength is high would help to reduce the amount of crushing of individual soil aggregates and resulting depth of compaction.

New road construction would result in loss of top soil and compaction of sub-soil on a maximum of approximately 3 acres of forested land which would be converted to non-forest (about 1.9% of the total project area).

Reconstructing and improving existing roads would result in a maximum of approximately 6 acres of current non-forest land (about 2.9% of the total project area) remaining in a non-forested condition. Some encroaching vegetation would be removed and surface rock would be added where needed.

Road gating after completion of logging would prevent periodic surface disturbance from vehicular traffic and allow water to flow off the road surface in an out sloped manner and into the forest duff, thereby reducing sedimentation into streams. Over time, the top soil on the road surface would be further stabilized by accumulating litter and plant re-growth.

In order to avoid damage to existing tree roots, skid roads would not be ripped to mitigate compaction. Mitigation would only be in the form of minimizing soil disturbance and compaction by yarding on top of slash as much as possible and conducting ground based yarding during periods of low soil moisture, using a minimum of yarding roads.

#### *Cumulative Effects*

Implementation of the proposed project in conjunction with other likely BLM actions in the Upper Alsea River watershed is unlikely to considerably contribute to cumulative effects to soil resources. Road construction and reconstruction/improvement is expected to impact approximately 9 acres of currently forested land, an increase/maintenance of road area in the watershed of approximately 0.26%. Although this increase is minimal, cumulative impacts from road activities are very difficult to quantify because roads are frequently being constructed and abandoned to support private logging activities.

Cumulative impacts due to logging activities (primarily compaction and soil disturbance) are likely to be minimal, as any disturbance will be mitigated by implementation of BMPs and will be localized (affecting less than 0.25% of the watershed). Some of the potentially impacted acreage includes already existing, compacted skid roads from previous logging activities which will not add to any existing cumulative effects. Tree harvest is not proposed on steep slopes (over 70%). Any activity on the relatively steeper areas would at most, involve the removal of a few trees per acre, leaving the majority of the trees, vegetation and forest litter in place to prevent dry ravel and erosion. We anticipate, however, that logging activities will continue to locally impact soil resources within the watershed on both federal and private lands. This would occur with less impact and be spaced out over a greater interval of time than what occurred in the original harvest cycle.

#### **Project 2:**

The proposed action is unlikely to produce any measurable effect on soil resources in the project area since trees girdled for snags or hand felled for CWD would be left in place and any resulting disturbance to the soil (compaction beneath felled trees) would be minimal and localized. Because no soil disturbance is expected from this project, it is unlikely to have considerable cumulative effects on soil resources in the Upper Alsea River watershed.

### **Project 3:**

Minor quantities of soil may enter the stream, primarily where the trees are felled into or immediately adjacent to the stream. Compaction of the surface soil from the felling of the trees would be negligible since the trees would remain in place where they are felled. Trees felled on or near the stream bank may reduce bank stability. No cumulative effects to soil resources are expected from this project.

#### *Alternative B: No Action*

A no action alternative would cause no change from the current condition of soil resources or in the aerial extent of disturbed soil as described in the Affected Environment section and in the *South Fork Alsea Watershed Analysis* (p. 23-32).

### ***Air Quality/Fuels***

#### **Air Quality/Fuels: Affected Environment**

The proposed harvest area is located approximately 17 air miles south of the town of Philomath, with scattered residences closer to the site. Based on visual estimates, using GTR-PNW-105, series 1-DF-4 and 3-DFHD-3, the estimated total dead fuel loading for the proposed harvest stands is in the 15 to 20 tons per acre range. Fuel model for these sites would be model 8 - closed timber litter (Air Quality/Fuels Report, SWAF).

#### **Air Quality/Fuels: Environmental Consequences**

##### *Alternative A: Proposed Action*

### **Project 1**

The increase in slash created by the proposed thinning would result in a higher risk of fire on the thinned sites following logging. We expect the dead fuel loading to increase by 5 to 15 tons per acre with a discontinuous arrangement. The resulting total dead fuel loadings would range from approximately 15 to 35 tons per acre. The fuel model would shift from Model 8 to Model 10/11 (Fuels/Soil Report, SWAF). Overall, the risk of fire following this action would be moderate because of the site's predominantly northern aspect, high elevation, and the continued existence of a tree canopy which would maintain cooler temperatures and higher humidity and shade fuels. Risk of fire would be greatest during the period when attached needles dry out during the first season following cutting. These "red needles" generally fall off within one year and the fire risk greatly diminishes. Fire risk would continue to diminish as the area "greens up" with understory vegetation and the finer twigs and branches in the slash begin to break down. In order to mitigate fire risk these sites should be monitored several years for the need to close or restrict access to the general area during periods of extreme fire danger.

Vegetation cleared for road construction, renovation and reconstruction would result in creation of approximately 150 to 200 tons of slash that would be scattered and/or piled along the right-of-ways (ROW). Most of this material would be piled and burned following harvest operations. However, some of this material would remain scattered in and adjacent to the ROW. Burning landing piles and slash concentrations along these ROW would reduce the risk of a fire start from human ignition sources. In addition, fire risk would be further reduced by restricting vehicle traffic (through road gates) following project completion.

Logging slash and brush would be burned only under conditions which comply with state and federal air quality guidelines, which serve to minimize entry of smoke into residential areas. Burning would be done in the fall under good atmospheric mixing conditions when the threat of impacting air quality in designated areas would be very low. During this time of the year, good mixing conditions and an increasing likelihood of rain storms would scour the air shed and extinguish residual fire fairly quickly. Any residual smoke should be of short duration and occur during a period of the year when there is less outdoor activity.

### *Cumulative Effects*

Implementation of the proposed project would contribute to the accumulation of fine and medium size fuels in the Upper Alsea River watershed. Part of this accumulation of fuel would be mitigated by piling and burning accumulations of slash at landings and along roads. Large amounts of fine and medium size class slash would remain within the treatment units. The fire hazard from these fuels would decrease over time as the fine needles and twigs fall off and breakdown during the first few years following harvest. The larger branches and tops would take longer to decompose, often up to 10-20 years. Re-sprouting of brush and growth of annual plants would produce a partially shaded, more humid micro-climate around the accumulated slash, thus reducing risk and accelerating decay. If treatment of forests within the Alsea basin were to be spaced out over a period of several decades, cumulative effects of slash would remain at manageable levels and not require extensive treatment. Where future treatments are proposed adjacent to recently treated areas, some additional fuel reduction work may be needed to manage the risk (i.e. pull back from roads, piling and burning strategic fuel free corridors, gating, etc.).

### **Project 2**

Creating snags and coarse woody debris would increase fuel loading and fire risk on site, however this increase is likely to be low due to the small number of trees being girdled/felled (Air Quality/Fuels Report, SWAF, pg. 8). Due to the scattered nature of this treatment, this project is not expected to contribute to cumulative effects on fuels or air quality.

### **Project 3**

Felling logs into the stream would not elevate fuel levels or fire hazard. Due to the project location within the stream channel or immediately adjacent to the stream, and the scattered nature of this treatment, this project is not likely to contribute to cumulative effects on fuels or air quality.

### *Alternative B: No Action*

With a no action alternative there would be no change from the current conditions for fuel resources and fire risk, other than those occurring from natural succession and/or storm events.

## ***Water***

### **Water: Affected Environment**

The primary stream draining the project area is the South Fork of the Alsea River (HUC# 17100205). The majority of the streams in the project area are small, colluvial headwater channels (Rosgen type “A”), with ephemeral or intermittent flow. Channel substrates are predominantly in the small gravel to sand size classes. The three channels on the north side of the project area are very steep and deeply entrenched streams (Rosgen type “Aa+”). These channels are subject to episodic landsliding and debris torrents, which correspond with high sediment transport rates. They are filled with large wood and debris, with moderately unstable side slopes. However, all the channels viewed in the field are currently in “proper functioning condition” (Hydrology Report, SWAF).

Neither the South Fork Alsea River nor its tributaries are listed on the state’s Clean Water Act mandated 303d list of impaired water bodies. However, the South Fork Alsea River flows directly into the Alsea River which is listed as not meeting water quality standards for summer stream temperatures from its mouth to its headwaters. The Lower South Fork Alsea (but not the Upper) is listed in the state’s 319 Report as having moderate water quality problems which may be affecting general water quality, fish and aquatic habitat (based on observation).

Recognized beneficial uses of project area in-stream flow include anadromous fish (approximately 2-3 miles downstream), resident fish, recreation, and aesthetic value. There are no known municipal or domestic water users in the project area. Irrigation and livestock watering occur in the Alsea valley, near the town of Alsea approximately 12 miles downstream. The project is not located in a key watershed.

### **Water: Environmental Consequences**

#### *Alternative A: Proposed Action*

### **Project 1**

Measurable direct and indirect effects to stream flow, channel function, and water quality as a result of this proposed action are unlikely. This action is unlikely to alter the current condition of the aquatic system either by affecting its physical integrity, water quality, sediment regime or in-stream flows.

Tree removal and road construction would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action. In addition, potential impacts resulting from tree harvest and road construction, which would be mitigated by the implementation of BMPs, are unlikely to contribute measurable amounts of sediment to streams. Although thinned, substantial portions of the riparian canopy (including all vegetation within SPZs) would be retained, maintaining riparian microclimate conditions and protecting streams from increases in temperature. In addition, most of the channels in the project area are ephemeral and have very little potential to be heated by exposure to direct solar radiation.

Since the proposed action is unlikely to result in any measurable increase in sedimentation or stream temperature and would not place large amounts of fine organic material in the stream or alter stream reaeration, it is unlikely that it would have any measurable effect on dissolved oxygen levels in project area streams.

Increases in mean annual water yield following the removal of watershed vegetation have been documented in numerous studies around the world (Bosch et al., 1982). Presumably vegetation intercepts and evapotranspires precipitation that might otherwise become runoff. Thus, it can be assumed that the action considered under this proposal would likely result in some small increase in water yield (including a small increase in summer base flow) which correlates with the removal of a portion of the conifer overstory. In addition, thinning could result in some small increase in peak flow events, as a result of increases in snow accumulation and melt-off during rain-on-snow events. However, because of the small percentage of forest cover being affected by this project (1.7% over the watershed) these increases to stream flow (mean annual yield, summer base flow, and peak flows) are unlikely to be measurable (Hydrology Report, SWAF).

Over the long term this proposal should aid in meeting ACS objectives by speeding the development of older forest characteristics in the Riparian Reserves, including increased large wood recruitment for stream channels. In the mainstem Upper South Fork Alsea River, large wood structure in the channel is particularly important because it has been depleted to levels far below its natural range. Large wood in the channel would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat as well as conditions for beaver.

Most of the proposed road construction would be renovation of existing roads. In three cases, these roads cross streams where the road fill is actively eroding. Resurfacing of these roads with crushed rock, repair of the drainage and fill, plus placement of new 100-year flood design culverts would improve road drainage and fish passage as well reduce sediment supply at these locations.

The proposed new road surfaces are limited to locations on or very near the ridge line which would eliminate interception/disruption of subsurface water flow. The new road surface would not cross any streams and is outside of riparian areas. Therefore it is unlikely to contribute fine sediments to the stream system. Road construction impacts to water quality would be further limited by restricting work to periods of low rainfall and runoff and construction would employ techniques to reduce concentration of runoff and sedimentation to a minimum.

The main haul routes would likely be on rocky forest roads to the Alsea Access road which is paved. Timber hauling during periods when water is flowing on roads and into ditches could potentially increase stream turbidity if flows from ditches are large enough to enter streams. Mitigation measures to deal with this potential problem are cited under the road inventory document produced for this sale (*Analysis of Road Surface Sediment Production and Delivery to Streams for the South Willie Project: Road Construction and Haul*, SWAF). Under this proposal, implementation of mitigation measures together with repair of the three fill failure/stream crossings would likely result in an overall reduction in fine sediment supply from the road system relative to the current condition.

#### *Cumulative Effects*

The proposed project is unlikely to contribute to cumulative effects to sedimentation or increases of stream temperature, because it is unlikely to produce any measurable effects on these parameters. Because the mechanical removal of vegetation and road construction in a watershed can result in increases in stormflow volume and earlier, higher peak flows, the proposed action was analyzed for its potential effects on peak flows and the potential for stream channel bed mobility and channel scour (*Hydrology Report and the supplemental report: Cumulative Effects Analysis for the Upper South Fork Alsea Watershed*, SWAF).

A preliminary analysis of the risk for cumulative effects to hydrologic processes, channel conditions and water quality for the Upper South Fork Alsea watershed was conducted utilizing the Salem District Watershed Cumulative Effects Analysis Procedure, FY1994. This analysis indicates that, when past activities together with likely near term management activities are considered, a moderate risk level for cumulative effects exists. As a result, a Level 1 and Level 2 analysis for increases to peak flow and risk to aquatic resources was conducted using the Washington State DNR watershed analysis methods (Washington Forest Practice Board, 1997).

In summary, the Level 1 analysis found a low sensitivity to increases in peak flows and low potential risks for aquatic resources for normal storm events. It found an “indeterminate” risk for “unusual” (larger than average) peak flow events associated with a 2-yr return interval. This analysis led to a level 2 analysis to provide greater precision. The level 2 analysis (Bed Mobility Analysis) indicated a low risk for effects to channel substrate as a result of the worst scenario estimated in the level 1 analysis. Therefore, it was concluded that potential cumulative effects leading to increases in peak flows, under this proposal in conjunction with other likely actions in the watershed, are low.

The primary potential cumulative effect in this watershed, in response to this proposal in combination with other likely actions on public and private lands over the next decade, is a likely increase in road use and road density which may result in an increase in fine sediment supply (primarily due to construction/renovation and use of roads). In response to the concern for fine sediment supply and road use in this watershed, a road inventory was conducted for the South Willie project (*Analysis of Road Surface Sediment Production and Delivery to Streams for the South Willie Project: Road Construction and Haul*, SWAF). In summary, fine sediment from logging roads is probably not a major source in general and could be reduced to immeasurable levels by implementing the mitigation and road upgrading measures that were suggested in the analysis.

Properly implemented, this proposal could result in a slight reduction in fine sediment levels relative to current conditions.

To the extent that this proposal would influence overall watershed condition, it potentially could result in short term, local increases in stream turbidity during road construction and repair (i.e., will only occur during and immediately after construction and is not likely to be visible or measurable downstream from the project area). These would be likely offset by long term reductions in the supply of fine sediment due to road repairs and upgrading.

The project would likely increase the supply of large wood (LWD) in the watershed, over time. Since LWD and pool habitat are “at risk” in these streams long term LWD supply to streams is likely the most critical factor for maintenance of aquatic habitat in the Upper Alsea watershed (*SFAWA* p.2). With the retention of stream protection zones, we expect this proposal to maintain LWD recruitment and aquatic habitat in this watershed over the long term.

### **Project 2**

Girdling trees for snags and felling trees for increased coarse woody debris is unlikely to have any measurable impact on water resources. Any disturbance to soil would be localized (outside of the stream protection zones) and unlikely to affect stream sedimentation, turbidity, temperature, or channel function. Because of the small amount of canopy and ground cover affected this project would be unlikely to contribute to cumulative effects in the watershed.

### **Project 3**

Felling logs into the stream may temporarily increase the amount of suspended sediment and flow turbidity; however this increase is likely to occur during and immediately following the proposed action and is not likely to be detected downstream. Over the long term, the action would slow stream velocities, increase sedimentation, increase the retention of organic matter, and could raise the channel bed level. Due to the small number of trees being felled, we would not expect the loss of root strength following felling to result in reductions of bank stability. Over the longer term, the addition of large wood into the channel may help to stabilize the channel banks by encouraging substrate attrition and restoring channel function. Since the immediate effects of this action are likely to be localized and occur during the project implementation, they would be unlikely to contribute to cumulative effects. However, as the aquatic habitat in this stream reach is slowly restored, this project would likely positively contribute to the overall function of streams in the Upper Alsea watershed.

### ***Alternative B: No Action***

No action would result in the continuation of current conditions and trends at this site as described in the Description of the Affected Resource section of this report, the Hydrologist Report in the South Willie NEPA/EA Analysis File, and in the *South Fork Alsea River Watershed Analysis* document.



## ***Fish***

### **Fish: Affected Environment**

The majority of streams in the project area are steep, intermittent/ephemeral headwater streams with step pool and cascade habitat and moderate amounts of wood. Due to their steep channels and little to no base flow, these streams contain no fish. Downstream, the South Fork Alsea River contains cutthroat trout (*Onchorhynchus clarkia*) and Sculpin (*Cottus* sp.). The project area is approximately 3.5 miles above Alsea Falls, an anadromous fish barrier.

### **Fish: Environmental Consequences**

#### *Alternative A: Proposed Action*

##### **Project 1**

The proposed action would have no measurable adverse impacts to local or anadromous fish or fish habitat. Impacts may occur due to small inputs of sediment, but would be short term (a year or less) and would not be expected to directly affect fish or fish habitat either locally or downstream (Fish Report, SWAF).

Sediment delivery to streams from tree harvest would be kept to a minimum; one-end suspension skyline yarding in sloped areas would limit soil disturbance, the amount of proposed vegetation to be removed is relatively small, the size of timber being hauled out is relatively small, stream protection zones would buffer impacts and help filter sediment and seasonal restrictions (operating during drier conditions) would considerably reduce the possibility of displaced soil reaching project area streams. All road construction, renovation and reconstruction work would be seasonally restricted and hauling would be closely monitored and mitigated to avoid water quality degradation.

Many older overgrown roads are vegetated and stable with no culverts; they are not rerouting surface water. These roads would not be disturbed and would be considered closed/decommissioned upon project completion. New roads being built are all on ridge tops and would not affect the aquatic environment.

Increases to stream temperature are also unlikely due to topographic shading in the project area, intermittent/ephemeral streams, and the application of stream protection zones (50 foot minimum width).

Increasing sunlight to remaining trees would increase the quality of long term large woody debris for in-stream function, complexity and aquatic habitat.

Coastal Coho Salmon (*Oncorhynchus kisutch*) are listed as threatened under the Endangered Species Act. Conferencing with the NOAA Fisheries on this proposed project has been conducted in accordance with current BLM policy (South Willie Biological Analysis and NOAA Fisheries Letter of Concurrence, SWAF). Coho Salmon are down stream from the proposed units approximately 3.5 miles at Alsea Falls.

### *Cumulative Effects*

This project is unlikely to contribute to cumulative effects on fisheries in the Upper Alsea River watershed due to the nature of thinning (it is unlikely to produce measurable local impacts), the small size of the project in relation to the watershed area, and because the majority of the watershed is federally managed (82%) and is designated as reserves.

### **Project 2**

Creating snags and coarse woody debris would have no impact on the aquatic system or fisheries because of the small number of trees cut (all of which would be outside the SPZ). There are no anticipated cumulative effects to fisheries from this project.

### **Project 3**

Dropping 4 trees per 1000 feet of stream would enhance fish habitat by increasing stream complexity and cover for fish. Short term impacts would include increased turbidity and possible bank scouring. These impacts would be short lived, minimal, and would be likely to occur during high water events. This project would contribute to enhanced fish habitat in the Upper Alsea River watershed.

### *Alternative B: No Action*

Under the No Action alternative, current stream habitat conditions would continue as described under Affected Environment and the *South Fork Alsea River Watershed Analysis*. Trees that would die from natural succession and competition would be of smaller average diameter, providing less effective and less durable wood for instream habitat for fish. Road drainage improvements would not occur and ditch lines would continue to direct road sediment and runoff directly into project area streams.

## ***Riparian Reserves***

### **Riparian Reserves: Affected Environment**

Riparian Reserves in the proposed project would be designated as 420 feet on each side of perennial fish-bearing streams and 210 feet on each side of intermittent and perennial non-fish bearing streams (*RMP* pg.10). The actual riparian vegetation along streams would be excluded from treatment and designated as stream protection zones (SPZ). Only the upslope portions of the Riparian Reserves would be proposed for density management (Riparian Reserves Report, SWAF).

The Riparian Reserves in the project area consist of young managed stands, approximately 50 years old, logged in the 1950's and pre-commercially thinned in the 1970's. The proposed project area consists of a uniform, densely stocked stand with a relative density over 0.60. The crown ratio (approximately 32%) is still relatively high and the canopy closure averages 75%. Some parts of the stand are heavily stocked with both overstory and understory western hemlock. Much of the overstory western hemlock is infested with dwarf mistletoe.

Hardwoods are scattered throughout the stands, but most occur along streams. No *phellinus* was observed in Riparian Reserves, but it may be present in scattered pockets. Vegetation within the stream protection zones is largely the same as the rest of the stands, with a slightly larger component of hardwoods and western red cedar (*South Willie Silvicultural Prescription*, SWAF).

The proposed project areas exceed cubic foot down wood requirements (as established in the *Late Succesional Reserve Assessment – Southern Portion* 1996), but lack adequate snags (Table 1, Riparian Reserves Report, SWAF).

Field observations of instream large woody debris within the project area indicated moderate to large amounts of wood (relative to other high gradient, intermittent channels in the Oregon mid-coast range). Much of this material remained after logging operations that occurred in the 1950s when logging practices were typically “messy” (i.e., large quantities of wood considered of inferior quality were left behind). Recent additions of wood are predominately smaller sized deciduous species and occasional second growth conifer that has blown down or fallen over due to slope instability.

## **Riparian Reserves: Environmental Consequences**

### *Alternative A: Proposed Action*

#### **Project 1**

Density management within the Riparian Reserves would result in more open stands, providing a wide array of ecological benefits. Desirable habitat for aquatic and riparian dependant species would be enhanced or maintained in the following ways: accelerated development of desired tree characteristics, maintenance of stand health and stability, restored structural complexity of stands, long term increase in quality large woody debris (LWD) recruitment, and enhancement of terrestrial down wood and snag characteristics.

Residual trees would increase in diameter and crown depth/width. Limb diameter on large limby trees would be maintained by releasing those trees to an open grown condition. The long-term results of density management would be larger average DBH, and larger crowns (higher crown ratios) at any given age, compared to the no treatment option (Riparian Reserves Report, SWAF).

Stands grown under more open conditions become more wind firm than very dense stands, both because individual trees experience more wind as they develop and because trees with less competition maintain their live crowns longer, giving them a lower center of gravity and decreasing their height/diameter ratios. Thinning also encourages epicormic branching which also lengthens crowns. Some researchers suggest that wind firmness and individual tree stability are factors in a tree reaching age 300 and beyond (Riparian Reserves Report, SWAF).

The proposed action would increase the amount of light penetrating the canopy, which would promote growth and development of vegetation found at mid canopy and ground levels. We expect that understory initiation of shade tolerant conifers associated with canopy layering would be promoted in areas of increased light over the long term.

In the short term a more complex shrub understory would develop. Some variable spacing would be accomplished by cutting extra trees in areas with a developing understory, or near trees with “woffy” characteristics. In addition, extra trees would be reserved next to existing snags, creating small clumps of trees.

Wood with a larger range of sizes would potentially be recruited into streams over the long term in treated stands. Near streams, but outside the stream protection zones, trees smaller than stand average and at a consequently higher risk of mortality, would reach an average 20" DBH more quickly with thinning, compared to the no treatment option, creating natural opportunities for larger LWD recruitment. Smaller wood would continue to fall from within the stream protection zone where no treatment takes place, and larger wood would begin to be recruited from higher up the slopes as the treated stands reach heights of 200 feet.

Opening up the canopy may cause such ground level microclimatic changes as increased light levels, increased temperatures, lower humidity and increased wind speed. These effects vary depending on aspect, slope and vegetation removed and are difficult to quantify. We expect that most microclimate changes near streams would be mitigated by the stream protection zones, and those that occur further from the streams would be of short duration and would be ameliorated as crowns close and brush covers the ground.

There would be a short term elevated risk of Douglas-fir bark beetle infestation in healthy standing trees, due to unyarded cut trees, windthrow, and logging damage to residual trees. Bark beetle infestation risk may be minimized by following guidelines developed for the Siuslaw National Forest. A summary of those guidelines is attached to the South Willie Riparian Reserves Report, (SWAF).

#### *Cumulative Effects*

Although direct effects from the proposed project would be local to the project area, the project would contribute to increased acreage of functioning Riparian Reserve habitat, thereby extending Riparian Reserve corridors within the Upper Alsea River watershed.

### **Project 2**

CWD and snag enhancement would be achieved using strategy # 3 as described in the *LSRA* (p.68). This strategy creates some short term CWD and snags, but reserves most as green trees to maximize long-term quantities and sizes of CWD and snags. Post harvest monitoring would be done to evaluate the size and condition of snags and CWD in riparian reserves. Creation of CWD during harvest could come from harvest activities, post harvest windthrow, and beetle kill. Monitoring would be done three years after harvest has maximized opportunities for natural creation of CWD and snags. After monitoring, trees would be cut and left and snags would be created where needed to meet recommendations of the resource area wildlife biologist. Most CWD and snags would be left as green trees until the upland portion of the project area is regeneration harvested, at which time additional CWD and snags would likely be created in the Riparian Reserves.

Opening up the canopy may cause such ground level microclimatic changes as increased light levels, increased temperatures, lower humidity and increased wind speed. However, these effects would be short term and on a very small scale, due to the small number of trees being girdled/felled (Riparian Reserves Report, p. 7, SWAF).

This project would contribute to the volume of CWD and snags in the Upper Alsea River Riparian Reserves, increasing the amount of potential habitat for riparian-dependent and other species.

### **Project 3**

Trees felled for aquatic habitat would be average stand diameter (17.4") or larger and would represent the largest trees to fall into the stream for the next 45 years. This is because the vast majority of trees to die and fall in the short term would come from the SPZ where no other treatments are proposed and most LWD would be less than 12". Additionally, these felled trees are the only ones guaranteed to fall into the streams, with all others falling naturally in generally random directions.

The small volume of trees being felled is unlikely to alter Riparian Reserve structure, function, or microclimate. This project would contribute to stream channel complexity and potential fish habitat within the Upper Alsea River watershed.

### *Alternative B: No Action*

Under the No Action alternative, there would be no disturbance due to management and consequently no short term microclimate changes in the Riparian Reserves. There would be no short term elevated risk of bark beetle infestation, however as stand health is compromised over time due to high densities, the risk of beetle infestation may increase.

Trees would continue at their present rate of growth, slowing as the canopy closes and competition for light becomes more intense. Crown ratios would decrease at a faster rate and wind firmness and individual tree stability would decrease as crown ratios decrease. Stand mortality due to competition would increase, creating larger amounts of small CWD and snags.

The relative density (RD) of the stands would remain higher than 0.6 if left untreated during the next 45 years (the point where mortality due to competition begins). In addition, the canopy would remain closed, allowing little light to penetrate to the ground. Therefore it can be concluded that no major understory would develop within the next 45 years and beyond without density management.

Natural disturbance would be the agent for creation of stand structural diversity. The most likely agent for this disturbance would be wind, which would create openings in patches. It is unknown how long it would take for natural disturbance to create the structural and species diversity needed in this watershed, but we expect, based on experience and a considerable body of research, that this diversity would take considerably longer to develop than if the proposed treatment were implemented.

## ***Wildlife***

### **Wildlife: Affected Environment**

The proposed 199 acre thinning/density management project is part of a 4800 acre mid-seral conifer forest, within the Salem and Eugene BLM Districts. Within this 4800 acre environment of mid-seral habitat there are scattered small patches of early (0-39 years) and late seral (80-199 years) habitat. None of these patches are large enough to provide interior forest habitat. Streams and roads provide corridor habitat throughout the matrix and they are usually dominated by deciduous hardwoods like big leaf maple and red alder. Mid-seral forests in the Coast Range of Oregon are currently dominated by Douglas-fir with scattered and clumped western hemlock, western red cedar, and various hardwoods. These forests have stands that are structurally simple and are characterized by a single-layered, dense, overstory canopy with little large wood, dead or alive, standing or down, remaining from the previous stand.

Special Status or Special Attention species which may be affected by this action are the marbled murrelet (*Brachyramphus marmoratus*) and the northern spotted owl (*Strix occidentalis caurina*); refer to Appendix A of the Wildlife Report for a complete list of species of concern in the Marys Peak Resource Area (SWAF).

The proposed project area has no suitable nesting/foraging/roosting habitat, Critical Habitat, or Reserve Pair Area habitat for the northern spotted owl. The mid-seral forest provides dispersal habitat for owls. The closest known active northern spotted owl site is a single bird about four miles to the northwest of the proposed project.

There is no suitable marbled murrelet habitat or Critical Habitat in any of the 12 units of the proposed project. The closest known occupied murrelet site is over six miles to the northwest of the project area. There is an eight acre patch of old-growth within 0.25 mile to the east of the project area that has not been surveyed to protocol and therefore it must be assumed to be occupied.

### **Wildlife: Environmental Consequences**

#### ***Alternative A: Proposed Action***

##### **Project 1**

The Matrix thinning and Riparian Reserve density management prescriptions for the proposed alternative would remove the suppressed, intermediate, and smaller co-dominant Douglas-fir and western hemlock and leave the dominant and larger co-dominant conifers. The treatment would remove approximately 98 trees per acre. Since the largest trees with the best crown ratios would be left the post-treatment crown canopy is expected to be 50 percent or greater over most of the action area. Some patches within the 22 acre mistletoe treatment area may fall below 40 percent canopy closure.

Currently the stands have abundant soft, and some hard snags and coarse woody debris but they are all in the smaller diameter classes. Management would abbreviate the recruitment time necessary for the development of larger (over 20 inch diameter) hard snags, coarse woody debris, and a more complex overall stand structure. A short term impact would be a simplification of stand structure due to the removal of trees, however the planned treatment would have little impact on the composition and function of these mid-seral stands.

The Salem BLM land parcels are primarily surrounded by Salem and Eugene BLM Matrix and Riparian Reserve lands. Acres within the Matrix would be final harvested (a future project) during the transition from mid to late-seral habitat at around 80 years old. The Riparian Reserve lands would be managed to restore and maintain late-seral and old-growth habitats adjacent to all existing streams. This corridor habitat would provide mature forest connectivity through the Matrix and between different aged patches. Thinning the Riparian Reserve habitat now would accelerate its structural development into late-seral habitat. Due to the corridor nature of the Riparian Reserve it would not provide interior late-seral or old-growth habitat in the watershed.

The thinning and density management project would have no negative impacts on owl nesting/foraging/roosting habitat. The long-term impact of density management on owl habitat in the Riparian Reserve would be positive as it would develop into suitable nesting/foraging/roosting habitat sooner than if left unthinned. The action may affect, and is not likely to adversely affect owl dispersal habitat in the Matrix and in the Riparian Reserves. Following project completion, northern spotted owls may avoid using the project area if they no longer feel secure in using it as dispersal habitat. However, a large amount of undisturbed dispersal habitat would remain in the watershed's mid-seral matrix.

The thinning and density management project would have no impact on murrelet potential or suitable habitat. The long-term impact of density management on murrelet habitat in the Riparian Reserve would be positive as it would develop into suitable habitat sooner than if left untreated. The action may affect, and is likely to adversely affect the murrelet for noise disturbance during the breeding season in a small patch of unsurveyed suitable habitat, which is less than 0.25 mile to the east of the project area. A daily time restriction on project activities would be implemented to mitigate this disturbance (Project Design Features in this EA, p. 10).

#### *Cumulative Effects*

The private and BLM Matrix lands would continue to provide early (0-39 years old) and mid-seral habitat in the South Fork Alsea watershed. However, under current management plans, these lands will never provide any substantial interior late-seral (80-199 years old) or old-growth (200+ years) forest habitat. Nonetheless, this project would likely enhance suitable wildlife habitat in the watershed.

### **Projects 2 & 3**

Trees to be girdled and/or cut would not be trees that are providing suitable nesting habitat for northern spotted owls or marbled murrelets. The number, size, and location of trees to be girdled or cut would not impact the quality of nesting habitat being provided by any trees in or adjacent to Riparian Reserve.

If suitable habitat occurs within 0.25 mile of the treatment area, the project would be restricted to outside the breeding seasons of the two birds to avoid any noise disturbance.

Trees to be cut or girdled would not contain any red tree vole stick nests in their live crowns. No trees would be cut or girdled that are within 200 feet of an active red tree vole nest.

These projects would have no negative cumulative impact to the watershed. These actions would have a positive cumulative impact to the health of the ecosystem by reintroducing key fish and wildlife special habitat components.

#### *Alternative B: No Action*

Under the No Action alternative, the uniform, single layered, mid-seral stands would continue to grow and develop into late-seral size and structure at a slower rate than if released through thinning. There would be no impacts to the mid-seral dependent wildlife species currently using these stands for nesting, foraging, dispersal, resting, and escape habitat. Species dependent on more complex structure would avoid these stands for a longer period of time.



## CHAPTER IV - MAJOR SOURCES

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## Chapter V - PUBLIC INVOLVEMENT AND CONSULTATION

### *Public Scoping and Notification*

- The general area was shown as Matrix and Riparian Reserve in the *Northwest Forest Plan* and the *RMP*. These documents were widely circulated in the state of Oregon and elsewhere, and public review and comment were requested at each step of the planning process.
- A description of the proposal was included in Salem Bureau of Land Management *Project Update* issues mailed in December 2000, March 2001, July 2001, September 2001, April 2002, July 2002 and January 2003 to more than 1200 individuals and organizations potentially affected by and/or interested in the project.
- A scoping letter was mailed on February 5, 2001 to potentially affected and/or interested individuals, groups, and agencies, including adjacent landowners, the Benton County Board of Commissioners, Oregon Department of Forestry, Oregon Department of Fish and Wildlife, National Oceanic and Atmospheric Administration (NOAA) Fisheries, U.S. Fish and Wildlife Service, and the Associated Oregon Loggers, Inc. Seven written responses to the scoping letter were received and all public input was filed within the Project Records. The BLM response to the comments received and the EA pages that address those concerns are referenced in Appendix 5 of this EA, List of Scoping Respondents.
- The EA and preliminary FONSI will be made available for a 30-day public review period in December 2003. Notification of the comment period will include: a news release announcing availability of the EA for public review and comment published in the *Corvallis Gazette-Times*; a letter to be mailed to those individuals, organizations, and agencies that have requested to be involved in the environmental planning and decision making process; posting the EA and FONSI on the internet at <http://www.or.blm.gov/salem/planning/index.htm>, under Environmental Assessments. Comments received in the Salem District Office, 1717 Fabry Rd SE, Salem, OR 97306, on or before the end of the 30-day comment period will be considered in making the final decision for this project.

## ***Consultation***

- In addition to the interdisciplinary team that developed and reviewed this proposed action, the following agencies or individuals were consulted:

U. S. Fish and Wildlife Service  
Oregon Water Resources Department  
Frances Philipek, BLM, Archaeologist  
Adjacent Landowners  
Private individuals  
Weyhauser Industries  
Oregon Department of Fish and Wildlife  
NOAA Fisheries  
Oregon Department of Forestry  
Starker Forests

- In accordance with regulations pursuant to Section 7 of the Endangered Species Act (ESA), the South Willie Timber Sale project was submitted for consultation with the USFWS as part of the *Programmatic Biological Assessment in the North Coast Province for Fiscal Year 2003-2004 Projects Which Would Modify the Habitats of Bald Eagles, Northern Spotted Owls, and Marbled Murrelets*. This consultation was concluded with the USFWS issuing a Biological Opinion (BO; tracking number 1-7-02-F-956, July 24, 2002). The BO determined that the level of any anticipated incidental take is not likely to result in jeopardy to the bald eagle, northern spotted owl, or marbled murrelet. All applicable terms and conditions of this BO have been incorporated as design features of this proposed project.
- Also in accordance with Section 7 of the ESA, the South Willie Timber Sale Project was submitted for consultation with the National Oceanic and Atmospheric Administration (NOAA), Fisheries Service. The Level 1 Team that assesses potential impacts to listed fish determined that the proposed project is “Not Likely to Adversely Affect” Oregon coast coho salmon or *Essential Fish Habitat (EFH)*. The Biological Assessment was submitted to NOAA Fisheries in July of 2003. The Letter of Concurrence was received from NOAA Fisheries on August 21, 2003 with the determination that the proposed project is “Not Likely to Adversely Affect Oregon Coast coho salmon” (SWAF). Any decision on the proposed South Willie Timber Sale Project would be in compliance with the Letter of Concurrence.

## CHAPTER VI - LIST OF PREPARERS/INTERDISCIPLINARY TEAM MEMBERS

NAME	RESOURCE ASSIGNED	INITIALS	DATE
Ashley La Forge	IDT Lead	AL	11/25/03
Russell Buswell	Engineering	RB	11/25/03
Bill Caldwell	Silviculture	BC	11-25-03
Tom Tomczyk	Fuels/Air/Soils	TT	11-25-03
Steve Liebhardt	Fisheries	SL	11/24/03
Amy Haynes	Riparian Reserves	AH	11/25/03
Gary Licata	Wildlife	gal	11-25-03
Ron Exeter	Botany, Noxious Weeds	RE	Nov 25, 2003
Carolyn Sands	NEPA	CS	11/26/03
Patrick Hawe & Ashley La Forge	Hydrology	PH	11/25/03
Randy Gould	Supervision	RG	11/26/03

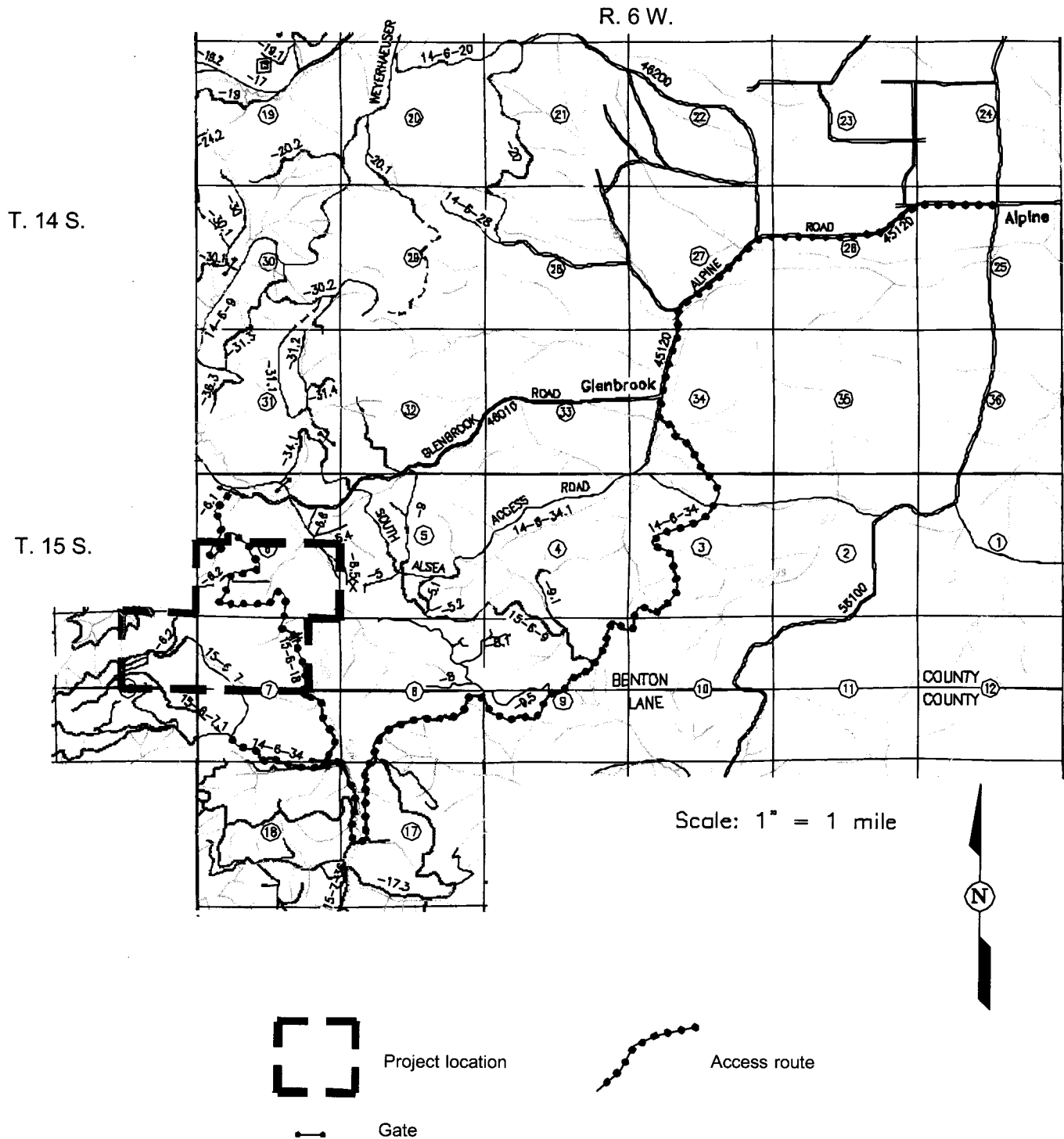
# CHAPTER VII - VICINITY & PROJECT MAP

November 17, 2003

United States Department of the Interior  
BUREAU OF LAND MANAGEMENT

T. 15 S., R. 6 W., Sections 6, 7 & 8 and T. 15 S., R. 7 W., Section 12, W.M. -  
SALEM DISTRICT - OREGON

South Willie Vicinity Map - EA# OR080-2001-02



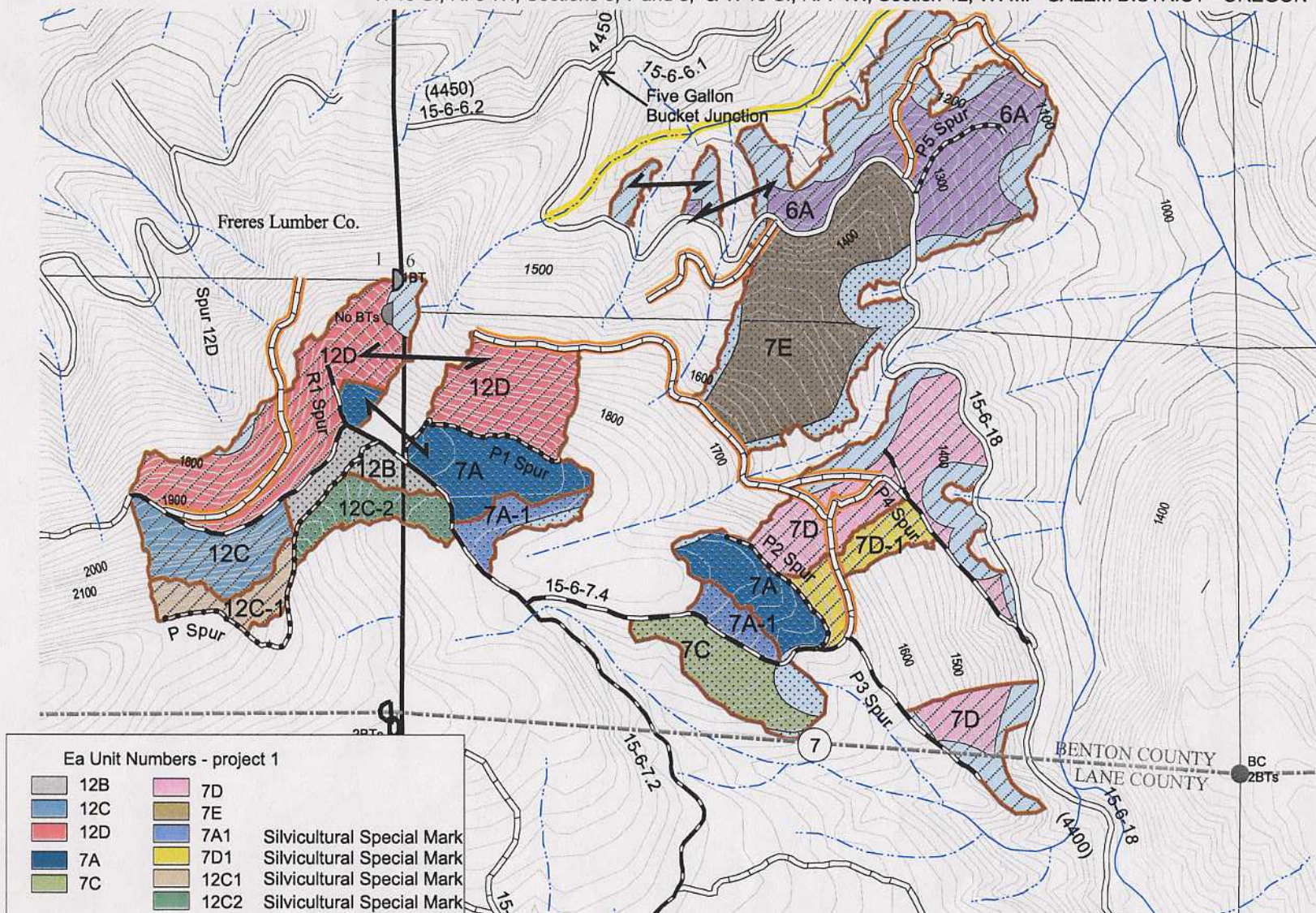
stanenberg



United States Department of the Interior  
BUREAU OF LAND MANAGEMENT

# SOUTH WILLIE EA MAP

T. 15 S., R. 6 W., Sections 6, 7 and 8, & T. 15 S., R. 7 W., Section 12, W. M. - SALEM DISTRICT - OREGON



## LEGEND

- |  |                           |                                      |
|--|---------------------------|--------------------------------------|
| Existing Road  | Fishbearing stream        | Proposed Ea Unit boundaries          |
| Impassable Road/Trail                                | Non-Fishbearing stream    | Ground based yarding                 |
| Proposed new construction                            | Project 3 - Fish Logs     | Skyline yarding                      |
| Existing road to be reconstructed/renovated/improved | Passive road decommission | Riparian reserves - projects 1 and 2 |
- Not traversed Ave. 50' R.R. buffers
- 0 300 600 900 1200 Feet

# APPENDIX 1 – Environmental Elements Review Summary

Environmental Assessment Number OR-086-03-04

In accordance with law, regulation, executive order and policy, the interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the alternatives described in Chapter II of the EA (environmental assessment). Table 1 below summarizes the results of that review. Those elements that are determined to be “affected” define the scope of environmental concern, Chapter III of the EA. Critical Elements of the Human Environment (BLM H-1790-1, Appendix 5) are in *italics*. Affected elements are **bold**.

Table 1. Environmental Elements Review Summary.

Elements Of The Human Environment	Status: (Not Affected or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks or Environmental Effects Not affected (direct, indirect, cumulative)– why Affected – cause/ effect, unit of measure (what is to be evaluated), design features beyond standard.
<i>Areas of Critical Environmental Concern</i>	<i>Not Affected</i>	<i>No</i>	<i>None present within project area.</i>
Special Areas Outside ACECs, within or adjacent (RMP pp. 33-35)	Not Affected	No	There are no special areas located within or adjacent to the project area.
<i>Prime or Unique Farm Lands</i>	<i>Not Affected</i>	<i>No</i>	<i>None present within the project area.</i>
<i>Wilderness</i>	<i>Not Affected</i>	<i>No</i>	<i>The project area does not include designated wilderness.</i>
Coastal zone	Not Affected	No	No anticipated measurable effects on the Oregon Coastal Zone (EA p. 6-24).
Key Watershed	Not Affected	No	The proposed project is not within a key watershed.
<i>Cultural, Historic, Paleontological</i>	<i>Not Affected</i>	<i>No</i>	<i>There are no known cultural resource sites located within the project area (Cultural Resource Report, SWAF, for surveys conducted for the new ground disturbance portion of the proposed action). Pursuant to the August 1998 protocol for managing cultural resources on lands administered by the BLM in Oregon, that portion of the proposed action that does not involve new ground disturbance is considered to be an exempt undertaking (Protocol, Appendix E, Transportation #5 and Other #13). If cultural resources are found during the implementation of the proposed action, the project may be redesigned to protect the cultural resource values present, or evaluation and mitigation procedures would be implemented based on recommendations from the District Archaeologist.</i>
Rural Interface Areas	Not Affected	No	None present within the project area.
Land Uses (right-of-ways, permits, etc)	Not Affected	No	The project would utilize two right-of-way agreements with private industry: R.W.A. S-121A with Freres Co. and S601 with Hull-Oaks; no changes made to existing agreements.
Mining Claims, Mineral Leases, etc	Not Affected	No	The proposed action does not include the extraction of any mineral resource.



<b>Elements Of The Human Environment</b>	<b>Status: (Not Affected or Affected)</b>	<b>Does this project contribute to cumulative effects? Yes/No</b>	<b>Remarks or Environmental Effects Not affected (direct, indirect, cumulative)– why Affected – cause/ effect, unit of measure (what is to be evaluated), design features beyond standard.</b>
Energy Resources	Not Affected	No	There are no known energy resources located in the project area. The proposed action will have no effect on energy development, production, supply and/or distribution.
<i>Environmental Justice (Executive Order 12898)</i>	<i>Not Affected</i>	<i>No</i>	<i>The proposed action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority and low-income populations.</i>
<i>Native American Religious Concerns</i>	<i>Not Affected</i>	<i>No</i>	<i>None known within the project area.</i>
<i>Hazardous or Solid Wastes</i>	<i>Not Affected</i>	<i>No</i>	<i>None known on site or to be created by proposed action.</i>
<b>Air Quality (Clean Air Act)</b>	<b>Affected</b>	<b>No</b>	<b><i>Pile burning may decrease air quality by temporarily increasing the amount of smoke in the project area. Unit of Measure: narrative of duration and extent of disturbance. Design Feature: in compliance with the Oregon Smoke Management Plan, EA Chapter II p. 3. Effects described in Chapter III Air Quality/Fuels section, p. 11-13.</i></b>
<b>Vegetation – Forest Environment</b>	<b>Affected</b>	<b>Yes</b>	<b>Density management would enhance the growth of residual trees, encourage understory and shrub development, and reduce the spread of dwarf mistletoe to uninfected stands. Unit of Measure: Rate of tree growth, understory development and mistletoe transmission. Design Feature: Described in the South Willie Silvicultural Prescription (Project EA File) and in the EA Chapter II p. 1-5. Effects described in Chapter II &amp; III, Vegetation/Botany section p. 6-8.</b>
Late Successional and Old Growth Species Habitat	Not Affected	Yes	No LSR or old growth habitat is present within the project area. The proposed action is likely to enhance the development of late successional and old growth species habitat, restoring its extent in the Upper Alsea River watershed. Unit of measure: anticipated rates of residual tree growth and CWD & snag levels. Design Features: silvicultural prescription, project design features described in EA Chapter II p. 1-5. Effects described in Chapter III.
<b><i>Invasive, Nonnative Species (Executive Order 13112)</i></b>	<b><i>Affected</i></b>	<b><i>No</i></b>	<b><i>Ground disturbance may increase the occurrence of invasive/ not native species. Unit of measure: description of the risk of increased rate of spread. Design Features: Grass seeding exposed soil areas [see Marys Peak Resource Area Botanical Report, SWAF]. Effects described in Chapter III, Vegetation/Botany section p. 6-8.</i></b>
Recreation	Not Affected	No	No anticipated effects to recreation use in the project area.

Elements Of The Human Environment	Status: (Not Affected or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks or Environmental Effects Not affected (direct, indirect, cumulative)– why Affected – cause/ effect, unit of measure (what is to be evaluated), design features beyond standard.
Soils (productivity, erodibility, mass wasting, etc.)	Affected	Yes	Ground base yarding & road activities may decrease site productivity, delay recovery from soil compaction from previous harvest entry and contribute to further compaction, and increase the risk of surface runoff and soil erosion. Unit of Measure: Description of compaction, risk of surface runoff and soil erosion. Design Features: dry operations, follow BMPs with regard to skid trails, operating yarding equipment on slash (RMP Appendix C), and minimizing the number of yarding roads (EA Chapter II p. 3-4). Effects described in Chapter III, Soils section, p. 8-11.
Special Status and SEIS Special Attention Plant Species/Habitat	Not Affected	No	No special status or SEIS special attention plant species were found during surveys for projects 1 & 2. For project 3, appropriate surveys would be completed prior to project initiation.
<i>Special Status and Special Attention Fish Species and Essential Fish Habitat</i>	<i>Affected</i>	<i>No</i>	<i>Hauling may result in the addition of sediment in streams which could affect downstream fish.</i> <i>Unit of Measure: Risk of sediment into stream.</i> <i>Design Features: Stream protection zones and seasonally restricted road &amp; harvest activities.</i> <i>Effects described in Chapter III, Fisheries section, p. 17-18.</i>
<i>Special Status and SEIS Special Attention Wildlife Species/Habitat</i>	<i>Affected</i>	<i>Yes</i>	<i>The proposed action may alter dispersal habitat for the northern spotted owl &amp; Marbled Murrelet within the watershed. Noise may disrupt nesting/breeding during the critical nesting season.</i> <i>Unit of Measure: Description of how thinning activities would modify habitat and noise and nesting success.</i> <i>Design Feature: Seasonal Restriction on operations and hauling from April 1 – September 15; no operations would begin until 2 hours after sunrise and cease 2 hours before sunset; all snags and CWD retained and additional created where deemed needed; reserve all open-grown trees and minority species for habitat diversity.</i> <i>Effects described in Chapter III, Wildlife section, p. 22-24.</i>
Visual Resources	Not Affected	No	The project area lies within VRM class II & VRM class IV; both classes allow for activities to be seen, with low-moderate changes to the landscape (RMP p. 36-37).
Aquatic Conservation Strategy Objectives	Affected	No	This proposal is likely to enhance attainment of the stream flow and basin hydrology, channel function, or water quality objectives of the Aquatic Conservation Strategy (ACS) because it will enhance riparian diversity, complexity and habitat and help restore instream function. (EA Appendix 2, Chapter III, Hydrology section, p. 13-16 and Riparian Reserves section, p. 18-21).

Elements Of The Human Environment	Status: (Not Affected or Affected)	Does this project contribute to cumulative effects? Yes/No	Remarks or Environmental Effects Not affected (direct, indirect, cumulative)– why Affected – cause/ effect, unit of measure (what is to be evaluated), design features beyond standard.
<i>Water Quality (Surface and Groundwater)</i>	<i>Affected</i>	<i>No</i>	<i>Road use may increase the risk of sediment into streams. Changes in canopy due to thinning may increase peak flows during major storm events. Units of measure: description of sediment risk, description of peak flows, WAR analysis. Project Design Features: operating during low flow, no-cut stream protection zone, retainment of duff/forest litter. Effects described in Chapter III, Hydrology section, p. 13-16.</i>
Listed Water Bodies (303d listed streams, DEQ 319 assessment)	Not Affected	No	No listed streams are within or immediately downstream from the project area.
<i>Wild and Scenic Rivers</i>	<i>Not Affected</i>	<i>No</i>	<i>None present within or downstream of project area.</i>
Downstream Beneficial Uses	Not Affected	No	The proposal is unlikely to affect downstream beneficial uses because any effects are likely to be localized and short term (Chapter III, Hydrology section, p. 13-16).
Municipal and Domestic Water Use	Not Affected	No	The project is not within a municipal watershed or near domestic water users.
<i>Flood Plains (Executive Order 11988)</i>	<i>Not Affected</i>	<i>No</i>	<i>No activities would take place within or adjacent to a floodplain.</i>
<i>Wetlands/Riparian Zones (including structural diversity)</i>	<i>Affected</i>	<i>Yes</i>	<i>Riparian areas adjacent to streams would be excluded from treatment (by no-cut stream protection zones). In Riparian Reserves, the project would help restore the species composition and structural diversity of riparian plant communities by enhancing understory development, increasing the proportion of minor species, increasing growth rates of remaining trees and creating fresh snags and CWD. The amount of functional riparian habitat would be increased in the watershed. Unit of Measure: Description of effect of diversity in stand, increased residual tree and understory growth. Project Design Features: Listed in Chapter II, p. 1-4. Effects described in Chapter III, Riparian Reserves section, p. 18-21.</i>

## Appendix 2 - Aquatic Conservation Strategy Objectives Review

### Summary for the Proposed Action

*(Note - See RMP pg 5-6 for more detailed explanations of the ACS objectives)*

ACS Objective	How The Proposed Action Meets the ACS Objective
<p>1. Maintain and restore distribution, diversity, and complexity of watershed and landscape features to ensure protection of aquatic systems.</p>	<p><u>Projects 1 and 2</u> Only 10 percent of the stands in the South Fork Alsea watershed are currently classified as having an understory. Most mid-seral stands (age 30-80) are uniform evenly-spaced Douglas-fir stands (RRTU, p.3). Generally the watershed lacks large woody debris potential for streams (SFAWA, p.65) and lacks snags, down wood, sub-canopy layers and species diversity (SFAWA, p. 40). The proposed density management project and snag creation/coarse woody debris enhancement would be a means to enhance late-successional forest conditions and speed up attainment of these conditions across the landscape. Since Riparian Reserves provide travel corridors and resources for aquatic, riparian dependant and other riparian and/or late-successional associated plants and animals, the increased structural and plant diversity would ensure protection of aquatic systems by maintaining and restoring the distribution, diversity and complexity of watershed and landscape features.</p> <p><u>Project 3</u> Felling trees into a tributary to the Upper South Fork Alsea River north of Unit 6A would increase the complexity of habitat in the stream and possibly increase the possibility of downstream transport of large wood into the Upper South Fork Alsea.</p>
<p>2. Maintain and restore spatial connectivity within and between watersheds.</p>	<p><u>Projects 1 and 2</u> Both terrestrial and aquatic connectivity would be maintained, and over the long-term, as Riparian Reserves develop late successional characteristics, lateral, longitudinal and drainage connectivity would be restored. In the short term, the fresh snags and down wood created by the project would begin to mitigate the lack of snags and down wood in the watershed.</p> <p>No stream crossing culverts would be used that would potentially hinder movement of aquatic species; therefore no aquatic barriers would be created.</p> <p><u>Project 3</u> Fish habitat and fish passage would be enhanced in the project area, increasing movement up and downstream for fish, and thereby increasing aquatic connectivity within and between watersheds.</p>

<p>3. Maintain and restore physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.</p>	<p><u>Projects 1 and 2</u> A no cut stream protection zone (SPZ) would maintain the integrity of shorelines, banks and bottom configurations. Criteria used to designate buffers were riparian vegetation, major slope breaks, active floodplain or high water tables, and areas contributing to stream shading. All buffers would be a minimum of 50 feet. Trees would be directionally felled within one tree height of the buffers and any part that falls within the buffers would not be yarded out (EA p. 2, Chapter III p.14), thereby preventing disturbance to stream banks and bottom configurations.</p> <p>In the short term, this proposal is unlikely to alter the current conditions of channels in the project area. Minimization of disturbances from the proposed project (e.g. increased flows or sediment delivery) is likely to result in the maintenance of stream channels in their current condition. (EA Chapter III p. 15-16).</p> <p>Over the long term, reductions in stand density will likely increase riparian forest health and tree size. This will lead to increased large wood recruitment for stream channels, an important factor in proper channel function.</p> <p><u>Project 3</u> Additional large wood in project area channels would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat. (EA Chapter III p. 16)</p>
<p>4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.</p>	<p><u>Projects 1 and 2</u> Stream temperature: In the case of stand thinning within Riparian Reserves, both small scale cover and large portions of upper story cover would remain intact. In addition, the proposed project leaves strips of unthinned overstory canopy adjacent to all streams including intermittent and ephemeral channels with no surface flow during the summer. These zones, which all extend above the stream adjacent slope break, provide substantial areas along all streams where no alteration of overstory stand density would occur (EA Chapter III p. 14, 20).</p> <p>Sedimentation and stream turbidity: All timber hauling and road construction would be restricted if necessary to avoid excessive increases in sedimentation. Additionally, improvements to existing roads would occur prior to hauling and would be ongoing as needed during the project. The small number of trees being yarded would limit surface disturbance due to yarding to minimal levels, and high levels of residual slash left on yarding corridors would reduce runoff by deflecting and redistributing overland flow laterally to areas where it would infiltrate into the soil. Additionally, stream protection zones would act as vegetative buffers, absorbing and deflecting overland flow before it reaches streams.</p> <p><u>Project 3</u> Small short term increases in turbidity may occur during the felling of trees into the stream. However, increases in turbidity would be very short term and minimal increases of sedimentation are expected due to maintenance of vegetated, stable banks. Any increase in turbidity would likely settle out just downstream. In the long term, the addition of logs to the stream would enhance sediment storage (EA Chapter III p. 16).</p>

<p>5. Maintain and restore the sediment regime under which system evolved.</p>	<p><u>Project 1</u> Best management practices (BMPs) and other measures would be implemented to eliminate and/or limit acceleration of sediment delivery to streams in the project area. Tree removal would not occur on steep, unstable slopes where the potential for mass wasting adjacent to stream reaches is high. Therefore, increases in sediment delivery to streams due to mass wasting are unlikely to result from this action (EA Chapter III p. 14). See also Number 4, above.</p> <p>Project design features would maintain the physical integrity of the hillslopes and channel; no alteration of the current sediment regime is expected.</p> <p><u>Project 2</u> No trees would be yarded, and therefore minimal disturbance to soil would occur.</p> <p><u>Project 3</u> Small short term increases in turbidity may occur during the felling of trees into the stream. However, increases in turbidity due to increased sedimentation would be very short term, due to vegetation remaining on stable stream banks. Any increase in turbidity would likely settle out just downstream. In the long term, the addition of logs to the stream would enhance sediment storage and increase channel bed levels (EA Chapter III p. 16).</p>
<p>6. Maintain and restore instream flows.</p>	<p><u>Projects 1 and 2</u> A Level 1 and Level 2 analysis for increases in peak flow and risk to aquatic resources was conducted using the Washington State DNR watershed analysis methods. Details of the analysis are contained in a supplemental report in the SWAF. In summary, both analyses concluded that potential cumulative effects leading to increases in peak flows, under this proposal in conjunction with other likely actions in the watershed, are low (EA Chapter III p. 15).</p> <p><u>Project 3</u> The direct, indirect and cumulative effects to project area hydrology would be similar to projects 1 &amp; 2 of the proposed action, with the exceptions (noted above in Number 4 and 5) of potential effects to the project stream channel.</p>
<p>7. Maintain and restore the timing, variability and duration of floodplain inundation and water table elevation in meadows and wetlands.</p>	<p><u>Projects 1, 2, and 3</u> The proposed thinning would not alter existing patterns of floodplain inundation or water table elevation as it would have no effects or only negligible short-term effects on existing flow patterns and stream channel conditions.</p> <p>Over the long term, reductions in stand density would likely increase riparian forest health and tree size. This would lead to increased large wood recruitment for stream channels, an important factor in proper channel function. Additional large wood in project area channels would ultimately slow stream velocity, increase retention of organic material, capture bedload, and improve aquatic habitat. Raising the channel bed level could eventually increase stream access to its floodplain, thereby restoring floodplain inundation.</p> <p>There are no meadows or wetlands in the project area.</p>

<p>8. Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide thermal regulation, nutrient filtering, and appropriate rates of bank erosion, channel migration and CWD accumulations.</p>	<p><u>Projects 1 and 2</u></p> <p>The actual riparian areas (as defined by criteria in the SWAF) along streams would be excluded from treatment, by designating no-cut stream protection zones. Only the upslope portions of the Riparian Reserves would be included in the density management treatment.</p> <p>Structural components of late-seral forests (large trees, multiple canopy layers, large hard snags, heavy accumulations of down wood, and species diversity) are generally lacking in the young stands surrounding and including the project area. In addition to protecting actual riparian vegetation, the proposed project would restore the species composition and structural diversity of plant communities by enhancing conditions for understory development (structural diversity), increasing the proportion of minor species in the stand (species diversity), increasing growth rates on remaining trees, as well as creating fresh snags and down wood.</p> <p><u>Project 3</u></p> <p>There would be little or no change to stream bank riparian vegetation or within the riparian zone along streams resulting from the proposed project.</p>
<p>9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.</p>	<p><u>Projects 1 and 2</u></p> <p>Habitat to support well distributed riparian-dependent and riparian associated species would be restored by reducing overstocked stands, moderating tree species diversity, altering forest structural characteristics and amending coarse woody debris conditions. Thinning within the Riparian Reserves would enhance stand conditions, growing trees faster than if the stand were to grow naturally. This would increase the potential for high quality instream large woody debris, thereby enhancing aquatic and amphibian habitat.</p> <p>Species linked to Riparian Reserves are mostly associated with late-seral forest conditions, which would be enhanced within this stand with negligible effects to existing function of the local Riparian Reserves corridors. Development of stand and individual tree characteristics desirable for riparian and old growth associated species would be accelerated by restoring structural complexity to the stands and by accelerating development of desired tree characteristics (increased diameter and increased crown depth/width).</p> <p><u>Project 3</u></p> <p>The proposed project would promote complex and diverse habitat types for fish, amphibians, and other aquatic species in a tributary to the Upper South Fork Alsea River.</p>

## Appendix 3 - Roads Table Summary

(Note: For road locations see Chapter VII, Project Map.)

Road No.	New Road construction (feet) <sup>1</sup>	Road Reconstruction (feet) <sup>1</sup>	Road Improvement (feet) <sup>1</sup>	Road Surfacing	Gate/ Waterbar	Passive Restore <sup>1</sup>
Spur P	2445	-	-	Rock	Gate	
Spur P1	1205	-	-	Rock	Gate	
Spur P2	1095	-	-	Rock	Gate	
Spur P5	-	815	-	Natural	Gate	
Spur P3	-	1560	-	Rock	Gate	
Spur P4	-	1670	-	Natural	Gate	
15-6-7.2	-	-	6870	Rock	Gate	
Spur 12-D	-	-	410	Rock	Gate	
15-6-7.4	-	-	2155	Rock	Gate	
15-6-18	-	-	-	None (Dry Weather Haul)	Gate	
<b>Totals</b>	<b>4,745</b>	<b>4,045</b>	<b>9,435</b>	-	-	<b>10,361</b>

<sup>1</sup>Note: All values are approximate.



## Appendix 4 - Unit Acreage/Yarding/Land Type System Summary

EA Unit #	Acres <sup>1</sup>			
	Yarding System	Matrix Upland	Riparian	Total
7A	Ground	11	0	11
7A1	Ground	9	0	9
7E	Ground	26	6	32
12B	Ground	10	0	10
12C2	Ground	4	0	4
<b>Total Ground Based Yarding</b>		60	6	66
6A	Skyline	13	20	33
7C	Skyline	9	4	13
7D	Skyline	26	9	35
7D1	Skyline	5	1	6
12C	Skyline	9	0	9
12C1	Skyline	4	0	4
12D	Skyline	31	2	32
<b>Total Skyline Yarding</b>		97	36	133
<b>Totals</b>		157	42	199

<sup>1</sup>Note: All values are approximate and represent the acreage analyzed for this environmental assessment. The actual number of acres affected by the proposed action would be less than the values presented above.

## Appendix 5 – Responses to Public Scoping

Public scoping consisted of mailing a scoping letter on February 5, 2000 to adjacent landowners and individuals or organizations who have expressed an interest in management activities in the Marys Peak Resource Area or specifically in the Upper Alsea River watershed. A description of the proposal was also included in the Salem BLM Project Update issues from December 2000 to July 2002. Nine comments were received regarding the proposed project. All public input was filed within the Project Record (SWAF). All comments presented in this document are summaries of the comments received:

- Kim Gossen – Coast Range Association (CRA). Concern: request for general information and availability of EA for review [response sent: 01/16/01, see FONSI p. 2 & Scoping p. 27].
- Oregon Natural Resources Council (ONRC). Concern: avoid timber harvest & road construction in designated roadless areas or wilderness; avoid commercial timber harvest in late-seral forests and pay special attention to snag habitat; complete special status species surveys, project analysis should discuss each ACS objective; a full range of action alternatives should be considered [response sent 03/02/01, see FONSI p. 2 & Appendix 1 p. A-1, Chapter I p. 7, Appendix 1 p. A-3, Appendix 2 p. A-5, and Chapter II p. 1-5, respectively].
- Freres Company. Concern: General interest in project and using the 15-6-18 road as a potential haul route [response sent 02/08/01, see Scoping p. 27 and Chapter VII Vicinity and Project Map].
- State of Oregon – Department of Fish and Wildlife. Concern: road construction and reconstruction could increase sedimentation to streams and detrimentally affect salmonid fish; stream crossings at or near headwall areas could lead to failures; road building as well as ground based yarding in Riparian Reserves could reduce amphibian habitat and the overall effectiveness of riparian reserves [response sent 02/27/01, see EA Project Design Features, Chapter II p. 4, Hydrology Environmental Consequences, Chapter III p. 13, Riparian Environmental Consequences p. 19].
- Larry Charney – Pulp and Paper Resources Council. Comment: “I send words of encouragement and approval for this planned sale...forests need to be managed for them to be healthy forests” [response sent 02/25/01, see EA Purpose and Need p. 7].
- George Sexton – American Lands Alliance. Concern: avoiding new road construction, tractor yarding, and regeneration harvest [response sent 11/09/01, see EA Chapter II p. 1].
- US Department of Commerce – NOAA Fisheries. Concern: Section 7 ESA consultation for listed fish species [response sent 08/20/03, see FONSI p. 3 & Consultation p. 28].
- Gary Blanchard – Starker Forest, Inc. Comment: reduction of fire hazard, maintenance of roads, and the generation of revenue are all benefits of an active timber sale program [response sent 05/27/03, see EA Purpose and Need p. 7].

- Karl Kassner – Flat Mountain Riders Association. Concern: project affects on recreation [response via phone 2001, see EA Appendix 1 p. A-2].

## Appendix 6 - Glossary of Terms & Acronyms

### Silvicultural Treatments

**Commercial Thinning - (even-aged management)** A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential future mortality. Disease centers and some hardwood patches may be patch cut as part of this treatment. Trees would be sold along with other timber.

**Density Management** - Same as commercial thinning, however the goals are to thin to meet objectives other than timber production. Trees may be sold or reserved depending on accomplishment of other resource objectives.

**Sanitation Harvest** - The removal of trees to improve stand health by stopping or reducing actual or anticipated spread of insects and/or disease. In this case it is dwarf mistletoe infestation.

**Slashing** - the cutting of brush species and damaged conifer understory trees after logging. The purpose is to put the material on the forest floor with other logging debris with the intent of performing site preparation and/or planting.

**Pile and Burn** - The piling of logging slash (debris) by hand or by use of mechanical means to concentrate the material for burning during wet weather. The piles are generally covered with plastic. This method extends the season during which burning of logging debris can occur.

**Planting** - Planting of trees in patch cut units. Species planted generally include a mix of species mimicking the harvested trees and those in the surrounding area. Trees usually are 1-1 bare root planting stock.

### Logging Systems Terminology

**Ground-based Logging** - Logging generally permitted on slopes less than or equal to 35 percent slope. Equipment can include rubber tired skidders, crawler tractors, tracked shovel loaders, harvesters, feller bunchers and or forwarders depending on resource objectives. Generally equipment is limited to pre-designated skid trails approved by the Authorized Officer.

**Cable Partial Suspension** - Logging that utilizes cable logging equipment employing a skyline to provide lift. Generally lateral yarding with slackpulling carriages and suspension of one end of the log when yarding to the landing is required.

**Cable No Suspension** - Cable logging where suspension is either not physically possible or not required. Logging systems used can be “highlead” or “skyline.” Generally an area immediately adjacent to landings has little to no suspension due to the laws of physics.

### Road Terminology

**Road Renovation** - Work done to an existing road which restores it to its original design standard. May include blading and shaping of a roadway, clearing brush from cut and fill slopes, cleaning or replacing culverts, and applying rock surfacing material to depleted surfaces.

**Road Improvement** - Work done to an existing road which improves it over its original design standard; may include widening of subgrade, upgrading existing culverts, and applying rock surfacing that exceeds original design standards.

**Road Reconstruction** - Work done to restore a damaged or deteriorated road to a usable condition and possibly a new design standard. May include road realignment, slide and fill failure repair and/or structure upgrades. Reconstruction generally involves a higher degree of engineering than basic road improvement/renovation work.

**Road Decommissioning** - Generally includes removal of culverts, re-establishment of natural drainage patterns and blocking of the road. Ripping and/or seeding of roadbed may accompany this activity.

### **Acronyms**

**ACS – Aquatic Conservation Strategy**

**BLM – Bureau of Land Management**

**BMP – Best Management Practice(s)**

**BO – Biological Opinion**

**CWD – Coarse Woody Debris**

**DBH – Diameter Breast Height**

**EA - Environmental Assessment**

**ESA – Endangered Species Act**

**FEIS – Salem District Proposed Resource Management Plan / Final Environmental Impact Statement (1994)**

**FONSI – Finding of No Significant Impact**

**GFMA – General Forest Management Area (land use allocation also known as “Matrix”)**

**HUC# - Hydrologic Unit Code Number (US Geological Survey)**

**LSRA – Late Successional Reserve Assessment (1996)**

**LWD – Large Woody Debris**

**NEPA – National Environmental Policy Act (1969)**

**NOAA – National Oceanic Atmospheric Administration**

**NWFP – Northwest Forest Plan (1994)**

**RMP – Salem District Record of Decision and Resource Management Plan (1995)**

**ROW – Right-of-Way (roads)**

**RR – Riparian Reserves (land use allocation)**

**S&M FSEIS - Final Supplemental Environmental Impact Statement For Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2000)**

**S&M ROD - Record of Decision and Standards and Guidelines For Amendment to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guidelines (2001)**

**SFAWA – South Fork Alsea Watershed Analysis (1995)**

**SPZ – Stream Protection Zone (no-cut protection zone/no-cut buffer/no-treatment zone/stream buffer)**

**SWAF – South Willie Timber Sale NEPA/EA Analysis File**

**USDI – United States Department of the Interior**

**USFWS – United States Fish and Wildlife Service**

**VMFEIS - Western Oregon Program-Management of Competing Vegetation Final Environmental Impact Statement (1989)**